The Municipality of
Metropolitan Toronto

Planning Department

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TO: THE METROPOLITAN TRANSPORTATION COMMITTEE
THE METROPOLITAN ECONOMIC DEVELOPMENT
AND PLANNING COMMITTEE

RE: HARBOURFRONT LRT

A. Introduction

Metropolitan Toronto Council, at its meeting of November 20, 1984, had before it a communication (November 13, 1984,) from the Assistant General Secretary, Toronto Transit Commission, forwarding a report entitled "Harbourfront LRT", which was considered and approved by the Commission at its meeting on November 13, 1984. The Toronto Transit Commission report recommended that Metropolitan Council be requested to approve proceeding with implementation of the Harbourfront LRT at an estimated cost, in 1983 dollars, of $52,000,000.00, or $70,200,000.00 including inflation to completion. Metropolitan Council referred the report to the Economic Development and Planning Committee, which, at its meeting of November 21, 1984,

> "decided to refer this matter to the Technical Transportation Planning Committee for a report thereon to a possible joint meeting of the Transportation Committee and the Economic Development and Planning Committtee, such report to include details on the possibility of recapturing the costs for this project from land owners and developers in the area."

This report summarizes the results of a comprehensive assessment of the proposal approved by the Toronto Transit Commission and various options which has been undertaken with assistance of staff from the City of Toronto Planning and Development and Public Works Departments. Included in this report are a re-evaluation of the need for the line; an assessment of various cost reduction measures, including private sector contributions; and a comprehensive assessment of alternatives to the previous proposal including The Streetcars for Toronto Committee proposal which was submitted to the Metropolitan Clerk in December, 1984.

B. Background

The Harbourfront LRT was initially proposed in the "Central Waterfront Transportation Study", (CWTS) first tabled with the Economic Development and Planning Committee and the Transportation Committee on June 14, 1983, at which time the Study was forwarded to area municipalities for comment.

At a joint meeting of November 23, 1983, the Economic Development and Planning Committee and the Transportation Committee considered the CWTS, and area municipal comments on it. At that time, the Committees directed staff to report further on several issues, particularly with respect to the site selected for a dome stadium and possible financial arrangements with the Province. Since that time, a stadium site in the Railway Lands has been selected, although no additional information is yet available on the Provincial position regarding transportation financing, with the exception of the Harbourfront LRT itself.

The CWTS had four major study objectives:

i. to maintain adequate access to the Central Area and particularly the Financial District;

ii. to improve public transit to Harbourfront, the Islands ferry dock and other waterfront activities;

iii. to provide access suitable for the emerging proposals for a redeveloped Exhibition Place; and,

iv. to provide sufficient access to allow development of the Railway Lands and the remainder of Harbourfront.

The CWTS stressed that the Harbourfront LRT was the key link to achieving objectives ii. and part of iv. The importance of the line in achieving these objectives has not changed, although recent developments have affected other recommendations contained in the CWTS.

Staff will be reporting on the CWTS in the near future when reports will also be tabled with respect to the Railway Lands development. The Harbourfront LRT is functionally independent from other facilities proposed in the CWTS, apart from the Spadina LRT, which can be considered as a future extension of the Harbourfront LRT. The Harbourfront LRT is crucial to the continued development of Harbourfront. As the Commissioner of Planning noted in a September 29, 1981, report to the Economic Development and Planning Committee:

> "Of the total 115,000 square metres of office uses which would be permitted by the proposed official plan amendment (for Harbourfront) only 66,155 square metres should be allowed to proceed at this time .... For the Harbourfront proposals remaining, (48,845 square metres of office use to be developed) major improvements to the levels of transit service should be established."

This report, adopted by Metropolitan Council on October 27, 1981, recommended that Metropolitan approval of the Harbourfront Official Plan amendment be conditional upon a tripartite agreement between the City of Toronto, Harbourfront Corporation and the Metropolitan Corporation. This agreement was to provide that office floor space in Harbourfront be limited to 66,155 square metres until Metropolitan Council was satisfied that the existing transportation facilities and committed improvements were adequate to serve projected traffic in the Harbourfront lands, and that when the need and alignment for an east-west transit corridor have been determined, Harbourfront Corporation dedicate any lands in its ownership for said corridor. These conditions were later approved at an Ontario Municipal Board hearing, in November, 1981, regarding the City of Toronto's Official Plan amendment for Harbourfront, and the noted agreement is now in force.

The CWTS subsequently identified the Harbourfront LRT as the preferred means of providing major improvements to the level of transit service in the area. As discussed further in this report, improved transit service will be necessary to minimize road congestion (through increased transit modal split) resulting from continued development in the area. For reference, Exhibit 1 indicates major existing and proposed developments in the waterfront area.

C. Need For The Line

1. Work Trips

Metropolitan Toronto, Toronto Transit Commission and City of Toronto staff have co-operatively developed estimates of peak hour ridership for the Harbourfront LRT. Based on current development proposals, and using assumptions consistent with the CWTS, estimated a.m. peak hour demands at full development are:

Inbound (to Waterfront)

Union Station to Harbour Street	3,400	passengers/hour
Bay/Queen's Quay - Eastbound	400	passengers/hour
Bay/Queen's Quay - Westbound	1,500	passengers/hour

Outbound (to Union Station)

Harbour Street to Union Station	3,000	passengers/hour

In the short-term (i.e. 2-3 years), based on development in place or under construction, a.m. peak hour demands are estimated to be:

Inbound (to Waterfront)

Union Station to Harbour Street	1500-1800 passengers/hour
Bay/Queen's Quay - Eastbound	200 passengers/hour
Bay/Queen's Quay - Westbound	250 passengers/hour

Outbound (to Union Station)

Harbour Street to Union Station	500-1000 passengers/hour

Several key assumptions underlying the estimates for full development should be noted:

- Assumed transit modal splits for work trips into the area average about 60 per cent. This is based on a high level of transit service and is higher than existing transit modal split, although lower than transit usage to the existing Financial District.

- Ridership estimates have assumed superior pedestrian connections to development sites within reasonable walking distance of Union Station. Consequently, for sites north of Queen's Quay, between Yonge Street and York Street, walking percentages from Union Station are assumed to range between 30 per cent. and 80 per cent.

- Transit ridership estimates assume the continuation of Bay Trolley Coach service south of Front Street. Approximtely 1,000 a.m. peak hour trips are forecast for the Bay Trolley Coach, destined to areas east of Bay Street.

- Outbound a.m. peak hour trips are based on a projection of approximately 7,500 residential units in the waterfront area, excluding the Railway Lands, which would produce a resident population of about 15,000 persons. A significant proportion of these residents can be expected to work in areas well served by transit, such as the downtown, and a 50 per cent. transit modal split has been assumed.

2. Recreational Trips

The waterfront area is one of the major generators of recreational trips in Metropolitan Toronto. Annual attendance (1984) at major attractions includes:

Ferry Docks	1,200,000
Harbourfront - Program Events	2,400,000

Harbourfront - Antique Market	1,500,000
Harbourfront - Arts complex	270,000

This total attendance of approximately 5.4 million annual visitors does not include people attending free events or retail facilities in the Queen's Quay Terminal. In addition, a number of major recreational attractions are proposed for Harbourfront, including a major Aquarium, a Computer Museum and several smaller specialized museums. These facilities could generate an additional 2-3 million visitors per year.

Current information on peak hour recreational trip making is limited. Accurate information is available only for the Ferry Docks where, during a typical summer Sunday, peak hour ferry ridership of 3,500-4,000 is achieved. Assuming a transit modal split of 32 per cent. (based on 1979 survey results), approximately 1200 ferry passengers per hour would use the Harbourfront LRT. Peak hour attendance and modal split percentages are, however, not available for Harbourfront. For the purposes of the current analysis, it is assumed that peak hour recreational ridership on the Harbourfront LRT will be approximately equal to peak hour (weekday) work trip ridership, once Harbourfront is fully developed. However, recreational peaks will likely be of a longer duration, say three to four hours on summer weekends, than will weekday work trip peaks.

In the near term (2-3 years), typical peak period summer weekend recreational ridership is estimated to be about equal to the near term weekday peak demand (i.e. 1500-1800 passenger trips per hour). However, ridership could be higher depending on the level of transit service provided.

It is expected that a large proportion of the recreational ridership will be composed of tourists to Metropolitan Toronto. To some extent, the Harbourfront LRT would be a component of the range of waterfront tourists attractions and would be instrumental in assuring the success of the attractions served.

3. Summary - Ridership

Estimated peak hour ridership on the Harbourfront LRT at full development is about 3,400 persons at the peak point, with a near term peak point demand of 1500-1800 persons. These estimates are assumed to be representative of both weekday work trip peaks and weekend recreational peaks. A key feature of the Harbourfront LRT is the relatively high proportion of reverse flow ridership during the weekday

peak and the high level of "off-peak" ridership on weekends. These factors will likely contribute to a higher-than-average revenue/cost ratio for the line, and a commensurately lower operating subsidy per rider.

The ultimate demand level projected for the Harbourfront LRT is sufficient to justify protected right-of-way operation with transit priority provided at signalized intersections. The high vehicle frequencies required for a demand level of 3400 persons would result in severe interference between transit vehicles and automobiles in a mixed traffic operation, particularly at intersections with high left-turn volumes.

It should be noted that even with the high transit modal splits assumed in this analysis, there will be substantial road congestion in the Waterfront area (discussed further in Section F, following). A high level of transit service, as would be provided by the T.T.C. proposal, will be necessary to ensure achievement of these modal split forecasts and minimize additional congestion due to increased automobile usage.

D. The T.T.C. Proposal

1. Summary Description

The LRT facility design proposed by the Toronto Transit Commission has a number of key features:

- underground loop at Union Station providing protected access for passengers connecting with the T.T.C. subway or GO Rail services;
- fully protected right-of-way on the median of Bay Street and Queen's Quay to a turnback loop at Spadina Avenue and Queen's Quay;
- signal priority treatment at grade crossings with automobile traffic; and
- restriction of access to developments to right-turn-in, right-turn-out movements only, with provision of two mid-block, signalized access points on Queen's Quay between John Street and Spadina Avenue. All movements (i.e. through and right, left and 'U' turns) will be permitted at signalized intersections on Queen's Quay.

The 1.7 km Harbourfront LRT was initially proposed in the CWTS in May, 1983, at an estimated capital cost of $29,000,000.00. The T.T.C. has proposed the use of new Articulated Light Rail Vehicles (ALRVs) as a means of minimizing overall operating costs and reducing potential traffic conflicts at signalized intersections. As noted in the CWTS, the Harbourfront LRT could be part of a staged light rail system which would include the Spadina LRT between Queen's Quay and Spadina Station on the Bloor Danforth subway line. With construction of the Spadina LRT, at an estimated 1983 cost of $45,000,000.00 (including $27,900,000.00 for vehicles) the two services could be operated independently or as one combined service. Exhibit 2 shows a plan of the T.T.C. proposal.

The current service proposal is designed to provide high levels of passenger accessibility, schedule regularity and high average speeds. It is a premium service which will be necessary to achieve the levels of transit usage outlined previously. These levels of demand will in turn be necessary to minimize the adverse impacts of road congestion in the area.

The currently proposed underground loop at Union Station is one of more than twenty-five off-street loop options examined by Toronto Transit Commission staff. The other options were rejected due to poor access to Union Station, physical fit problems, impacts on the properties of other agencies or excessive costs. While not the lowest cost off-street loop option the current proposal is considered to be the optimum trade-off in terms of cost, ease of implementation and passenger service.

2. Revised Cost Estimates

T.T.C. Staff, in their Harbourfront LRT presentation to the Commission, noted that there were potential opportunities for reducing the projected capital costs of the facility. This analysis has confirmed that there are indeed a number of means of reducing facility capital costs, while maintaining the major characteristics of a high quality transit service as provided by the current proposal.

Based on revised demand forecasts, it is estimated that rolling stock (at ultimate demand levels) can be reduced from the originally estimated 10 ALRVs to 5 ALRVs, for a capital cost savings of $8,750,000.00. In addition, an allowance was made for acquisition of land at Spadina Avenue and Queen's Quay for an LRT turnback loop. Harbourfront has agreed, in principle, to provide this land as part of their contribution to the project, for a cost savings of $1,300,000,00.

A major item in the November 1984 capital cost presented by the Toronto Transit Commission was for strengthening of the Spadina Bridge to allow a service connection from existing trackage north of the bridge to the Spadina/Queen's Quay loop. Discussions with the City of Toronto Commissioner of Planning and Development have confirmed that the Railway Lands Part II Plan developed by the City of Toronto will indicate the City position with respect to the bridge, that is, that the bridge should be reconstructed to meet ultimate requirements prior to any Railway Lands development, including a new stadium. Given the proposed implementation schedule for the stadium, it is reasonable to assume that reconstruction of the Spadina Bridge will take place concurrently with construction of a Harbourfront LRT and temporary strengthening of the bridge will be unnecessary. It should be noted that the City position will be that bridge reconstruction should be at no cost to the City, while Metropolitan staff have indicated to City of Toronto staff that the railway companies should assume 100 per cent. of bridge reconstruction costs. Accordingly, this item, which was originally budgetted at $5,000,000.00, has been deleted from the Harbourfront LRT account.

Revised cost estimates are shown in column 2 of Exhibit 3. Costs, in 1983 dollars, are reduced from $52,000,000.00 (November, 1984, estimates) to $37,000,000.00, for a total capital cost savings of $15,000,000.00.

3. PCC Option

As a means of reducing the initial cost of the Harbourfront LRT while maintaining the high level of transit service provided by the current proposal, the option of using existing PCC streetcars for the initial years of operation has been examined. The PCC fleet has been rebuilt once already, and extending their lifespan is difficult. Rebuilding them in the T.T.C. shops is not seen as practical, and a cost estimate was sought from the U.T.D.C. for such a rebuild. The cost per car, in 1983 dollars, would be about $440,000.00 per vehicle, providing an added life expectancy of 10 years. Refurbishment of 8 vehicles would thus cost $3,500,000.00.

There would be numerous problems with this approach. The PCC cars would not meet modern standards in terms of ride comfort, heating and ventilation, lighting, smoothness of propulsion, and energy consumption. Moreover the rebuilding would simply be a deferral; new vehicles will still be required. The PCC streetcars would also have significantly higher maintenance costs, and would have higher operating costs than ALRV's due to their lower capacity.

If the principal objective is to defer large front-end costs, the preferred approach would be to use the surplus PCC vehicles available without rebuilding them, which would be possible for about five years. Some work would naturally have to be done on the cars as a matter of course, and service regularity would suffer due to the vehicle change-offs required. However, with a large number of spares available as a maintenance fleet, the reliability problems would be manageable, and the initial capital savings would be significant.

As shown in Exhibit 3, the PCC refurbishment option has a higher initial capital cost, at least $31,700,000.00 versus $28,200,000.00 for the use of existing vehicles; a comparison of the net present value (i.e. including necessary future expenditures, in 1983 dollars) of all options examined is shown in Exhibit 6. The option of using unrefurbished vehicles is recommended as it would minimize disruption to T.T.C. maintenance programs and would, in the longer term, realize lower operating costs due to the earlier replacement of old vehicles.

E. Alternative Service Options

1. Busway Option

An alternative means of reducing the initial capital cost of the Harbourfront LRT, while maintaining high levels of transit service is through the initial implementation of busway service with future upgrading to LRT. This concept assumes that all infrastructure, with the exception of trackwork, (i.e. underground connection to Union Station, protected right-of-way on Bay Street and Queen's Quay) would be built during the first phase, and the service provided by either diesel buses or trolley coaches. As development proceeds and transit demand builds, new light rail vehicles would be introduced (in about five years time after opening). This concept has two major advantages:

- Initial capital costs are lower than any of the LRT-only options. As shown in Exhibit 4, first phase capital costs are estimated to be $23,800,000.00 for diesel bus and $26,900,000.00 for trolley coach. However, the latter is only $1,300,000.00 less costly than the option of using existing (unrefurbished) PCC cars.

- Risk is minimized if demand does not reach projected levels, due to a lower initial capital investment.

However, there are significant problems associated with either the diesel bus or trolley coach concepts:

- For both options, the major problem would be service disruption resulting from upgrading of the line, which would require re-routed or substandard service for a period of approximately one year.

- T.T.C. staff have determined that refurbishment of existing trolley coaches is not feasible, given the current state of repair of the twenty-five year old fleet. Per vehicle costs for the small number of new coaches required could be higher than the $300,000.00 estimated.

- The diesel bus option is not environmentally desirable, particularly at the Union Station underground loop, where diesel fumes could be a problem despite the provision of special ventilation equipment.

In summary, the advantages of the busway option are lower initial capital cost and a minimization of risk if demand does not reach projected levels. Disadvantages include disruption during upgrading and, for diesel buses, questions of environmental acceptability.

2. Mixed Traffic Options

As shown in Exhibits 3 and 4, the single most costly component of the Harbourfront LRT is the grade-separated loop at Union Station. As a cost reduction measure, a number of surface, mixed traffic looping arrangements were examined. In December, 1984, the Streetcars For Toronto Committee submitted a proposal for a mixed traffic, fully at-grade Harbourfront LRT to the T.T.C. and the Metropolitan Clerk.

The Streetcars For Toronto Committee proposal has been reviewed by staff, including preparation of capital cost estimates. The review has addressed only the Harbourfront LRT component of the line, and excludes a review of the proposed Spadina LRT. This proposal has a number of advantages over other mixed traffic options, particularly with respect to passenger access to Union Station, and can be considered the optimum LRT mixed-traffic option.

Major characteristics of the Streetcars For Toronto proposal are:

- an off-street loop at Peter Street and Front Street, where land is currently available;

- mixed traffic operation between Peter Street and York Street, via Front Street;

- protected operation on Front Street between York Street and Bay Street, with passenger access to Union Station via stairways/escalators between street level and the Union Station mezzanine. This operation is similar to the transfer between the Yonge subway and the Bloor streetcar, prior to opening of the Bloor-Danforth subway; and

- continuation of the line southerly on Bay Street from Front Street at street level. From the point where the line enters the Bay Street viaduct, it is assumed to be in protected right-of-way, as per the current proposal.

Initial capital costs prepared for two options to this proposal are estimated to be between $25,000,000.00 and $31,200,000.00 and are shown in Exhibit 5. One option assumed use of refurbished PCC cars, with ALRV replacement after ten years; and, the other asumed use of existing PCC cars, with ALRV replacement after five years. While initial capital costs are from $500,000.00 to $3,200,000.00 lower than the comparable PCC option based on the current proposal, total capital costs will be higher, as shown in Exhibit 6, due to the future purchase of a larger vehicle fleet.

The major advantage of the Streetcars for Toronto Committee proposal is the additional service that could be provided to sites west of Bay Street, including the Metropolitan Convention Centre and the future Canadian Broadcasting Corporation (CBC) development. Also, such a proposal would eliminate a costly grade separation at Union Station as presently contempleted.

While the additional service would benefit certain developments, major congestion problems would result at the Bay Street/Front Street and York Street/University Avenue/Front Street intersections. In addition, such a line would be of a longer length (producing higher annual mileage and a larger fleet), have a lower average speed and would result in significantly higher operating costs with no significant increase in ridership.

Furthermore, the cost savings of eliminating the grade separation at Union Station would be offset by additional capital costs for:

- property, specifically the turnback loop at Peter Street and Front Street;

- an additional 1.1 km of double track;

- increased vehicle requirements (15 PCC's versus 8); and

- a relatively expensive connection to the Union Station mezzanine.

For the reasons cited above, the Streetcars For Toronto Committee proposal is not considered acceptable.

3. Reserved Bus Lanes

Other mixed traffic or reserved bus lane options were reviewed. At full development, it would be difficult to provide sufficient capacity with a reserved bus lane operation to meet the anticipated levels of transit demand. On the other hand, the lack of a direct connection to Union Station and poorer schedule reliability (than protected LRT) would likely result in lower transit usage, which in turn would increase road congestion. In either case, a reserved lane transit operation would not be considered an improvement sufficient to permit Metropolitan Council approval of further office development in Harbourfront and would do little to improve transit access to existing recreational facilities in the area.

In the shorter term, the mixed traffic or reserved lane alternatives could be considered as staging options to the protected right-of-way facilities. Again however, longer travel times, poorer schedule reliability and an inconvenient transfer at Union Station would likely result in lower transit ridership and increased road congestion. Occupancy of office space in Harbourfront would be delayed and no significant improvement in Waterfront transit service would be provided.

In summary, mixed traffic or reserved lane options, while having a negligible initial capital cost, do not provide significant improvements in transit service to the Waterfront and would do little to promote development and recreational use of the area.

4. Pedestrian Connections

In preparing transit demand forecasts for the Harbourfront LRT, consideration was given to the role of pedestrian facilities serving the Waterfront area. Based on relative walking and transit travel times to specific developments, proportions of transit passengers exiting Union Station were assigned to the Harbourfront LRT, with the general rule that where walk and transit times were equal, 50 per cent. would walk and 50 per cent. would use the LRT.

At the request of Alderman Hope, T.T.C. staff have examined the feasibility of providing a moving walkway as an alternative to the Harbourfront LRT below-grade loop at Union Station. Three options were examined:

Option 1:
At-grade through the Toronto Terminals Railway teamway, through the existing Post Office building, elevated across Lakeshore Boulevard to connect with an at-grade LRT loop on the Toronto Harbour Commission property west of Bay Street between Lakeshore Boulevard and Harbour Street. Estimated capital cost, including the shortened LRT, is $27,700,000.00

Option 2:
Underground on Bay Street from Union Station to the north side of Queen's Quay. LRT service would be provided on Queen's Quay only. Capital cost is estimated to be $40,900,000.00

Option 3:
Primarily elevated, as an extension of the "Blue Route" pedestrian system, this facility extends from Union Station to the north side of Queen's Quay via a mid-block alignment which serves the CP portion of the Railway Lands, the Toronto Harbour Commission property and Waterpark Place. Estimated capital cost, including LRT on Queen's Quay, is $30,200,000.00.

While two of the three options have a lower total capital cost than any of the LRT options, there are a number of problems associated with the moving walkway proposal:

- The additional travel time and inconvenience of a walk (even if assisted) between transit services would result in lower transit usage, particularly to Harbourfront office developments, and create additional road congestion in the area.

- No significant improvement for recreational trips to the waterfront, especially to Harbourfront activities, is provided.

- Questions regarding responsibility for operating and maintaining the system have not been resolved.

- Possible safety and security problems could arise if the walkways are unmanned.

For the reasons cited above, moving walkways are not considered to be a viable alternative to improved transit service to the waterfront. Nevertheless, it is proposed that improvements to pedestrian facilities to complement a Harbourfront LRT be pursued. Based on preliminary discussions with consultants to Marathon Realty and the Toronto Harbour Commission, it was determined that the developers nearest

Union Station are considering superior pedestrian connections to Union Station with a level of amenities (e.g. retail facilities) similar to that provided in the existing downtown underground pedestrian mall system. In addition, Waterpark Place, as part of its agreement with the City of Toronto to transfer commercial density to the Scotia Plaza Site, will be providing a "Blue Route" extension to Queen's Quay. Discussions with these developers should continue to ensure that improved pedestrian connections are provided as development proceeds.

In conclusion, pedestrian facilities should be considered an integral part of the transportation system serving the Waterfront. They do not, alone, provide a viable alternative to improved transit service.

F. Traffic Impacts

At the time of the review of the Harbourfront Official Plan Amendment (described in Section B, preceding), it was expected that the eventual transit service to Harbourfront would utilize a fully exclusive grade-separated alignment which did not interfere with traffic operations. Further analysis has resulted in the current LRT proposal which, due to its shared use of road space at intersections, has resulted in traffic impacts not initially anticipated. Consequently, a detailed analysis of traffic impacts has been undertaken as part of the current review of waterfront transit options.

1. Approach

The Metropolitan Roads and Traffic Department has conducted an analysis of traffic impacts associated with proposed development. In determining road volumes, traffic associated with new development (assuming a 40 per cent. average auto modal split) was added to observed 1984 volumes to estimate future conditions. Two scenarios were tested:

(a) assuming full access to all development sites, consistent with a mixed traffic or reserved lane transit operation; and

(b) access to developments restricted to right-turn-in, right-turn-out movements only, consistent with a median protected right-of-way transit operation. Recognizing that this scenario would result in the most severe traffic impacts, two means of minimizing road congestion were examined: (1) restriction of new development to levels allowed by current zoning; and, (2) extension of the underground portion of the Harbourfront LRT to a point north of Queen's Quay, thereby eliminating traffic/transit conflicts at the Bay/Lakeshore and Bay/Harbour intersections.

The traffic impact analysis assumed that road facilities would remain as at present. None of the improvements recommended in the CWTS (e.g. Front Street extension, new F.G. Gardiner ramps at Strachan Avenue, widening of York Street) were considered in the estimates of intersection capacity. The only assumed modification to F.G. Gardiner ramps was the elimination of the Yonge Street east-bound on-ramp, considered necessary for the development of the Toronto Harbour Commission property.

2. Summary of Traffic Impacts

Based on the analysis of traffic impacts, the following conclusions have been drawn:

(a) Regardless of the transit option tested, significant future road congestion is projected in the area. Volume-to-capacity ratios in excess of 1.00 for some or all of the through and turning movements were calculated for the following intersections:

- Bay street - Lakeshore Boulevard
- Bay Street - Harbour Street
- Bay Street - Queen's Quay
- York Street - Queen's Quay
- York Street - Lakeshore Boulevard
- York Street - Harbour Street
- Simcoe Street - Queen's Quay

(b) The impact of heavy pedestrian flows on traffic operations has not been considered. As noted previously, it will be important to provide pedestrian facilities which, to the extent possible, reduce pedestrian volumes on Bay Street.

(c) Traffic assignments have assumed the extension of both Simcoe Street and John Street between Queen's Quay and Lakeshore Boulevard. The current analysis indicates that both of these roads will be necessary to minimize congestion if a protected right-of-way LRT facility is implemented.

(d) Additional development over that allowed by current zoning (i.e. about 50,000 square metres of commercial space in Harbourfront and about 69,000 square metres on the Toronto Harbour Commission property) increases traffic congestion only marginally.

(e) Although not explicitly considered as part of the current analysis, the Front Street extension and new ramps to the F.G. Gardiner Expressway proposed in the CWTS would improve traffic operations in the waterfront area by diverting traffic from outside the study area which now uses Lakeshore Boulevard to access west-bound expressway ramps.

(f) Congestion forecast at the York/Harbour and York/Lakeshore intersections would be substantially relieved by the widening of York Street to three lanes in each direction, as recommended in the CWTS. As noted previously, this improvement and the Front Street extension will be addressed in greater detail when staff report back on the balance of the CWTS proposals in the near future.

(g) The extension of the underground portion of the LRT to north of Queen's Quay mitigates the traffic impacts associated with shared LRT/traffic intersection operation at the Bay/Lakeshore and Bay/Harbour intersections, assuming that the Bay Street widening originally agreed to for LRT is provided for traffic purposes. While the cost of this extension is high (estimated at $9,700,000.00, including an underground loading platform at Harbour Street), it would allow an additional lane of pavement to be provided on Bay Street which would significantly reduce anticipated traffic congestion.

Based on the conclusion that traffic congestion would be severe for any transit option, and given that measures designed to improve transit operations tend to impact negatively on traffic operations, and vice versa, a qualitative assessment was carried out to determine the optimum trade-off between transit and traffic operations. The results are shown in Exhibit 7. The optimum transit operations are LRT in protected median right-of-way, and buses in reserved curb-side lanes, with automobile right turns permitted. The latter operation is similar to the bus lanes currently in operation on Eglinton Avenue east and west of Yonge Street. Given that the foregoing analysis has indicated an ultimate need for LRT capacity and the requirement for a protected transit right-of-way, this option is recommended, despite the adverse effect on traffic operations. These can be alleviated by extending the underground portion of the LRT to a point north of Queen's Quay, thereby eliminating traffic/transit conflicts at two of the severely congested intersections, namely Bay/Lakeshore and Bay/Harbour. The right-of-way width provided for LRT should be maintained, with the additional pavement width now being used for vehicular traffic. A special three-phase signal control would be used at all other

intersections, permitting transit and right-turn/through movements during one phase, back-to-back left and 'U' turns during the second phase and cross-street movement during the third phase.

The traffic impact analysis has indicated that, even with substantial improvement of transit service, road congestion will be severe. It should be noted, however, that any reduction in transit service levels (e.g. mixed traffic transit operations), will result in even greater levels of road congestion, due to lower transit usage. Negative impacts resulting from shared LRT/traffic intersection operations at the Bay/Lakeshore and Bay/Harbour intersections can be alleviated by extending the underground portion of the LRT to a point north of Queen's Quay. Despite the expected levels of road congestion and the need for non-conforming traffic operations, such as 'U' turns at intersections and left-turns from other than the left lane, the protected right-of-way LRT option is judged necessary to prevent a further deterioration in traffic operations.

G. Financing and Developer Contributions

1. Normal Financing

It is expected that the Provincial Government, through its Transit Capital Assistance Program, will provide a normal subsidy of 75 per cent for the public portion of the Harbourfront LRT capital costs. If the full cost were assumed by Metropolitan Toronto and the Province, the Metropolitan Toronto share, assuming extension of the underground section of the line to north of Queen's Quay and initial implementation of ALRV's, would be $11,700,000.00, in 1983 dollars.

2. Developer Contributions

To date, contributions or committments to contribute to the Harbourfront LRT have been made by the Harbourfront Corporation. These contributions, estimated to have a value of about $6,000,000.00 include:

- provision of an exclusive transit right-of-way on Queen's Quay;
- strengthening of the Peter Street Causeway and Bridge to support LRT traffic;
- removal of existing railway tracks on Queen's Quay; and
- dedication of land at Spadina Avenue and Queen's Quay for an LRT loop.

In addition to the Harbourfront Corporation contributions, negotiations have been concluded with the Campeau Corporation to secure the required additional right-of-way on the west side of Bay Street.

Beyond these contributions there appear to be limited opportunities to secure additional private sector monies for the Harbourfront LRT. The City of Toronto Commissioner of Planning and Development recently enquired of area land-owners their views on capital contributions to the facility. At this time, no response has been received. It should noted that, of the major land-owners, Marathon Realty (CP Railway Lands) is directly served by Union Station and does not require LRT service, the Toronto Harbour Commissioners will depend primarily upon pedestrian connections and are not well served by the LRT, and both Harbourfront Corporation and Campeau Corporation feel their contributions to date are sufficient.

In addition to voluntary contributions from area landowners, there are numerous other methods of securing private sector contributions which have been applied in the United States and Europe. These "value capture" techniques typically involve special assessments levied in station areas to be applied to transit facility capital costs. While these techniques could be applied for future transit construction in Metropolitan Toronto, there are two major impediments to their use for the Harbourfront LRT. Firstly, there is currently no legislative mechanism which would allow Metropolitan Toronto, or area municipalities to levy such a transit assessment. The process of implementing the necessary institutional reforms could be a time consuming one which would further delay construction of a Harbourfront line. Secondly, there is the question of fairness related to retroactive special assessments. Special levies are normally prescribed prior to development proposals. In the case of the Waterfront area, development proposals are well advanced and introduction of new assessment requirements could cause hardship to the area landowners.

In summary, there does not appear to be a great likelihood of future private sector contributions to a Harbourfront transit facility other than railway company contributions to Spadina bridge reconstruction. While Metropolitan policy has generally been that the additional assessment generated by transit related developments is adequate compensation for the necessary public capital expenditures, it may be useful to review value capture measures which have been applied elsewhere for possible future use in Metropolitan Toronto.

H. Implementation

As part of the Harbourfront LRT implementation process, two key procedural issues must be addressed: need for and preparation of an Environmental Assessment; and, preparation of necessary Official Plan Amendments.

1. Environmental Assessment

The Environmental Assessment Act requires that any municipal construction undertaking whose value exceeds $2,000,000.00 (1977 dollars) be subject to a full Environmental Assessment (EA). During the past several years, the T.T.C. has participated in the preparation of a draft Municipal Transit Class Environmental Assessment document. Class EAs are intended to streamline the formal Ministry of Environment approval process for projects with relatively minor or easily predictable environmental impacts, that are likely to occur frequently and/or have a generally consistent planning and design process. It should be noted that a class EA can be "bumped-up" to a full EA at any point during the process, at the discretion of the Minister.

Under the provisions of the Municipal Transit Class EA, the proposed Harbourfront LRT, being 1.7 km in length, would require only a class EA. However, the service connection to Spadina Avenue and King Street, if considered as part of the line, would exceed the 2.0 km length limit proposed for the class EA and a full EA would be required. The T.T.C. had requested the previous Minister of the Environment to designate the line as subject to the class EA. To date, no official response has been received.

At the present time, the Municipal Transit Class EA document is in draft form and has no official status. Pending a resolution of this matter in the near future, it is assumed that a full environmental assessment will be required for a Harbourfront line regardless of the vehicle technology used.

2. Official Plan Amendment

Sections 1.D.21 of the Metropolitan Toronto Official Plan defines light rail transit as:

> "a form of rapid transit using electrically powered vehicles operating on rails within a reserved right-of-way which may or may not be grade-separated from intersecting roads, and which is

capable of providing a capacity in the range of 5,000 to 20,000 passengers per hour in each direction".

Although this definition was originally developed to describe facilities such as the Scarborough RT (originally designed for LRT operation), where rail or hydro rights-of-way would be used, it does accurately describe the Harbourfront LRT (which would be capable of at least 5,000 passengers per hour in each direction). Accordingly, amendments to Figure 3 - Urban Structure, Figure 5 - Designated Metropolitan Centres and Figure 7 - Major Transportation Facilities will be required for the Harbourfront LRT, and must receive Metropolitan Council approval prior to implementation.

For a trolley coach or diesel bus staged option utilizing an exclusive right-of-way, Official Plan Amendments could be deferred until conversion of the line to LRT.

I. Summary of Benefits of a Harbourfront LRT

On the basis of capital cost per mile or capacity provided, the Harbourfront LRT, regardless of the option consisidered, is an expensive transit facility. Nevertheless, the line is considered to be a necessary, integral component of the transportation system serving the waterfront area, generating the following benefits for Metropolitan Toronto:

- Achievement of Transit Modal Split Targets

The high transit service levels provided by the Harbourfront LRT will help to increase transit usage and, consequently, minimize road congestion. The expected high levels of road congestion would be even worse without the provision of a superior transit service.

- Full Development of Harbourfront

Implementation of the Harbourfront LRT will allow Metropolitan Council to approve the further 48,845 square metres of commercial development in Harbourfront which has been restricted pending transit improvements. This additional development, when occupied, is expected to generate in excess of $1,000,000.00 annually in general purpose and school board taxes for the Metropolitan Corporation. Also, the LRT would promote full occupancy of existing office space in Harbourfront.

- o Access to Recreational Facilities

  The central waterfront, including the Toronto Islands, is one of Metropolitan Toronto's major recreational facilities. The Harbourfront LRT will provide improved accessibility to the waterfront for all residents of Metropolitan Toronto and will promote more intensive use of these resources.

- o Service to Resident Population

  The resident population of the waterfront area at full development is expected to be approximately 15,000 persons, with a high expected labour force participation rate. A Harbourfront LRT line will promote higher levels of transit usage by these residents and should contribute to a higher revenue cost ratio for the line.

- o Tourism Promotion and Economic Development

  The waterfront has become one of the major tourist attractions in Metropolitan Toronto. The Harbourfront LRT, by providing direct, convenient access for visitors, will promote increased tourist attendance at waterfront facilities and events.

In summary, private expenditure is continuing in commercial, residential and recreational development in the Harbourfront area. Residents, employees and area visitors will in turn generate annual expenditures. The net effect is an increase in jobs, taxable assessment and revenues for Metropolitan Toronto.

J. Conclusions

From the foregoing analysis, the following conclusions have been drawn:

1. Even with the high modal splits assumed in estimating ridership for the Harbourfront LRT, road congestion will be substantial. A lower transit modal split would create extreme road congestion problems in the area, particularly during weekday peak periods. Therefore, a high level of transit service as provided by the T.T.C proposal will be necessary to ensure achievement of the modal split targets and realize the full development potential of the area.

2. Based on an assessment of traffic impacts, it is concluded that an underground extension of the Harbourfront LRT to a point north of Queen's Quay, at an additional cost of $9,700,000.00 is warranted. This

assumes that the additional right-of-way width on Bay Street originally agreed to for LRT will be retained and utilized for traffic use. In addition, the current analysis has verified that implementation of the Front Street extension and widening of York Street, as recommended in the CWTS, will be necessary to maintain acceptable traffic operations in the waterfront area.

3. A number of alternatives to the T.T.C. proposal have been assessed including the Streetcars for Toronto Committee proposal and a summary comparison of these is shown in Exhibit 8. The major advantage of the various alternatives is a lower estimated capital cost than the current T.T.C. proposal. However, each has problems which limit their feasibility. The Streetcars for Toronto Committee proposal serves additional development along Front Street but would have lower schedule reliability, increased traffic interference, lower operating speeds and higher operating costs due to its mixed traffic operation. The staged trolley coach or bus alternatives, with eventual conversion to LRT have a capital cost advantage and provide the full service benefits of the protected right-of-way LRT option. Their major disadvantage is the additional disruption and inconvenience which would be incurred during the upgrading of the busway.

4. An acceptable method of reducing the initial capital cost of the LRT line is the use of unrefurbished PCC vehicles in the short-term. Although vehicle reliability will be lower than with the initial implementation of ALRV's or CLRV's, T.T.C. staff estimate that sufficient reliability can be maintained for a life expectancy of five years. Based on an acceptable level of transit performance and a substantial initial capital cost savings, the preferred transit option is the use of unrefurbished PCC vehicles, and purchase of ALRVs in approximately five years time. The estimated cost of this option is $44,000,000.00 in 1983 dollars ($50,400,000.00 in 1985 dollars), or $76,400,000.00 including inflation to completion, estimated for 1988. The impact on the T.T.C. 5-year Capital Works Program, assuming a 75 per cent. Provincial subsidy, is shown in Exhibit 9. The inflated cost estimate is subject to revision once approvals have been obtained and an accurate construction phasing plan has been developed. The cost includes the proposed extension of the underground portion to north of Queen's Quay and assumes that Harbourfront will provide the land for the Spadina loop and the City of Toronto will require that the Spadina Avenue bridge be rebuilt in conjunction with any development of the Railway Lands, including the new domed stadium. Regarding the latter, Metropolitan staff should be authorized to enter discussions with the railway companies regarding the Spadina bridge reconstruction.

5. A high level of transit service will promote development of the Waterfront area. Particularly regarding recreational activities, the waterfront is a Metropolitan resource which will become more attractive with improved transit services. Recreational ridership (both resident and tourist), is, in fact, a major justification for the provision of a protected right-of-way transit service. Continued development will result in an increase in employment, taxable assessment and revenues for Metropolitan Toronto.

K. Recommendations

It is recommended that:

1. (a) Metropolitan Council direct the Economic Development and Planning Committee to hold a public meeting on May 29, 1985, at 3:30 p.m. for the purpose of hearing deputants and receiving written submissions concerning a draft official plan amendment (copy attached) which would revise the Metropolitan Official Plan by:

   (i) indicating on Figures 3 and 5 the (Harbourfront) rapid transit line described in this report, and

   (ii) indicating on Figure 7 the (Harbourfront) light rail transit line described in this report.

   (b) Metropolitan Council direct the Metropolitan Clerk to give notice of the above recommended public meeting in accordance with Ontario Regulation No. 402/83 under the Planning Act.

   (c) the Commissioner of Planning be directed to report to the Economic Development and Planning Committee at the proposed public meeting concerning any submissions received prior to that meeting, or, if necessary, to the following meeting of the Executive Committee.

2. The Technical Transportation Planning Committee report immediately on the road improvements required in connection with the Central Waterfront Transportation Plan, and specifically the Harbourfront area, in order that Council may be apprised of all transportation requirements associated with the Harbourfront area before making a final decision with respect to the Harbourfront LRT.

3. Subject to Council's adoption of the above noted draft official plan amendment, Council

(a) approve implementation of the Harbourfront LRT line, from Union Station along Bay Street and Queen's Quay to a loop at Spadina Avenue, utilizing unrefurbished PCC vehicles, as described in Section 3.4 of this report at an estimated cost of $76,400,000.00, in escalated dollars, further subject to the following conditions:

(i) approval or exemption of the project under the Environmental Assessment Act;

(ii) approval of the necessary official plan amendment by the Minister of Municipal Affairs and Housing;

(iii) agreement by the Minister of Transportation and Communications to provide a 75 per cent. Provincial subsidy for the capital cost of the line, in inflated dollars;

(iv) preparation of an agreement with the railway companies, satisfactory to the Toronto Transit Commission and the Commissioner of Roads and Traffic regarding reconstruction of the Spadina bridge;

(v) provision of land at Spadina Avenue and Queen's Quay for an LRT turn back loop by Harbourfront Corporation;

(b) approve the amendment of the Toronto Transit Commission's 1985 Five-Year Capital Works Program to reflect the revised capital cost for the facility;

4. the City of Toronto Council be advised that implementation of the Harbourfront LRT will require immediate construction of both John Street and Simcoe Street between Queen's Quay and Lakeshore Boulevard; and

5. authority be granted for the appropriate Metropolitan officials to take any necessary action to give effect thereto.

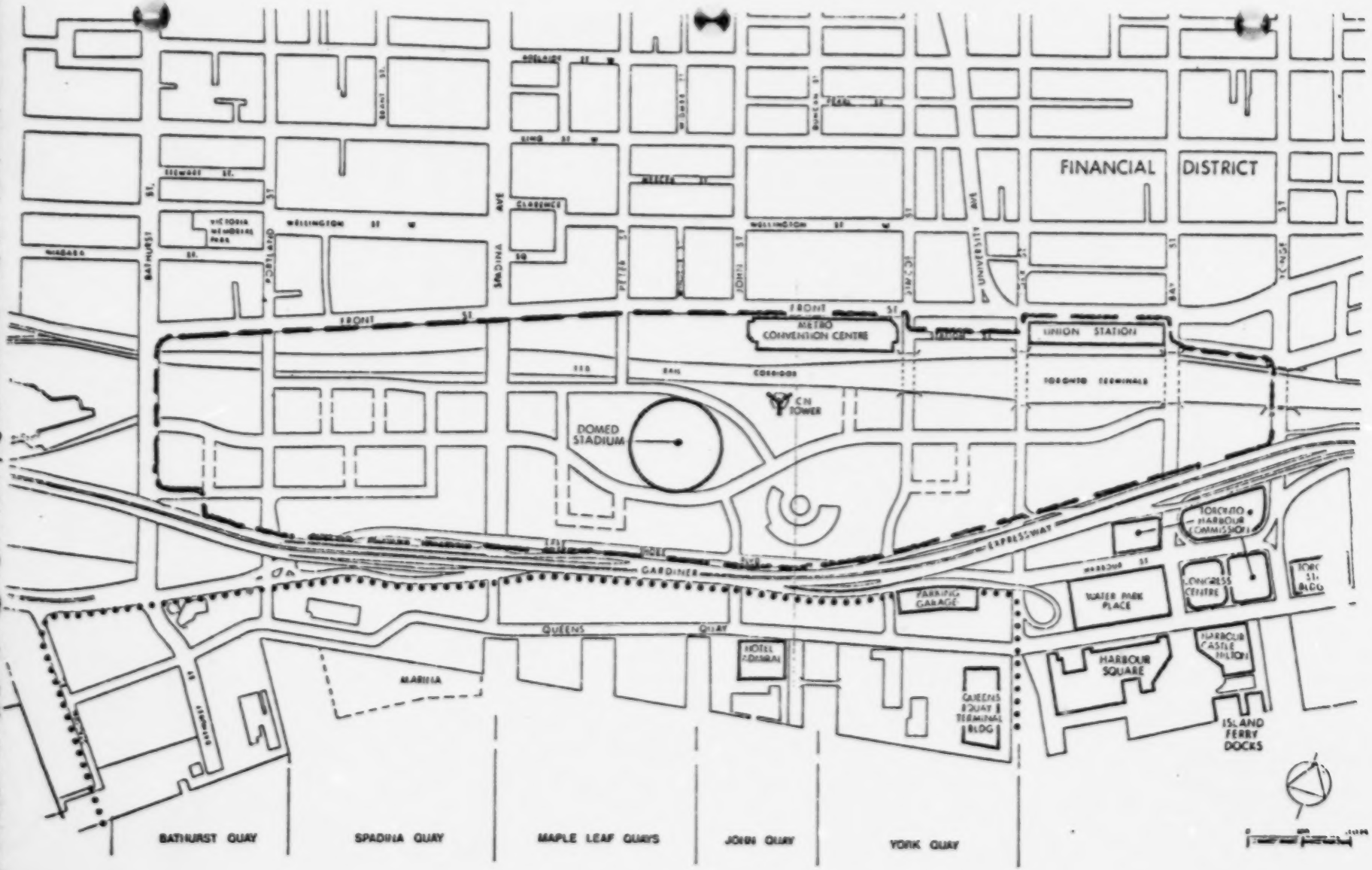
DCF/br

R.J. Bower
Commissioner of Planning
Metropolitan Toronto

S. Cass
Commissioner of Roads and Traffic
Metropolitan Toronto

A.H. Savage
Chief General Manager
Toronto Transit Commission

D.P. Floyd
Executive Director
Economic Development

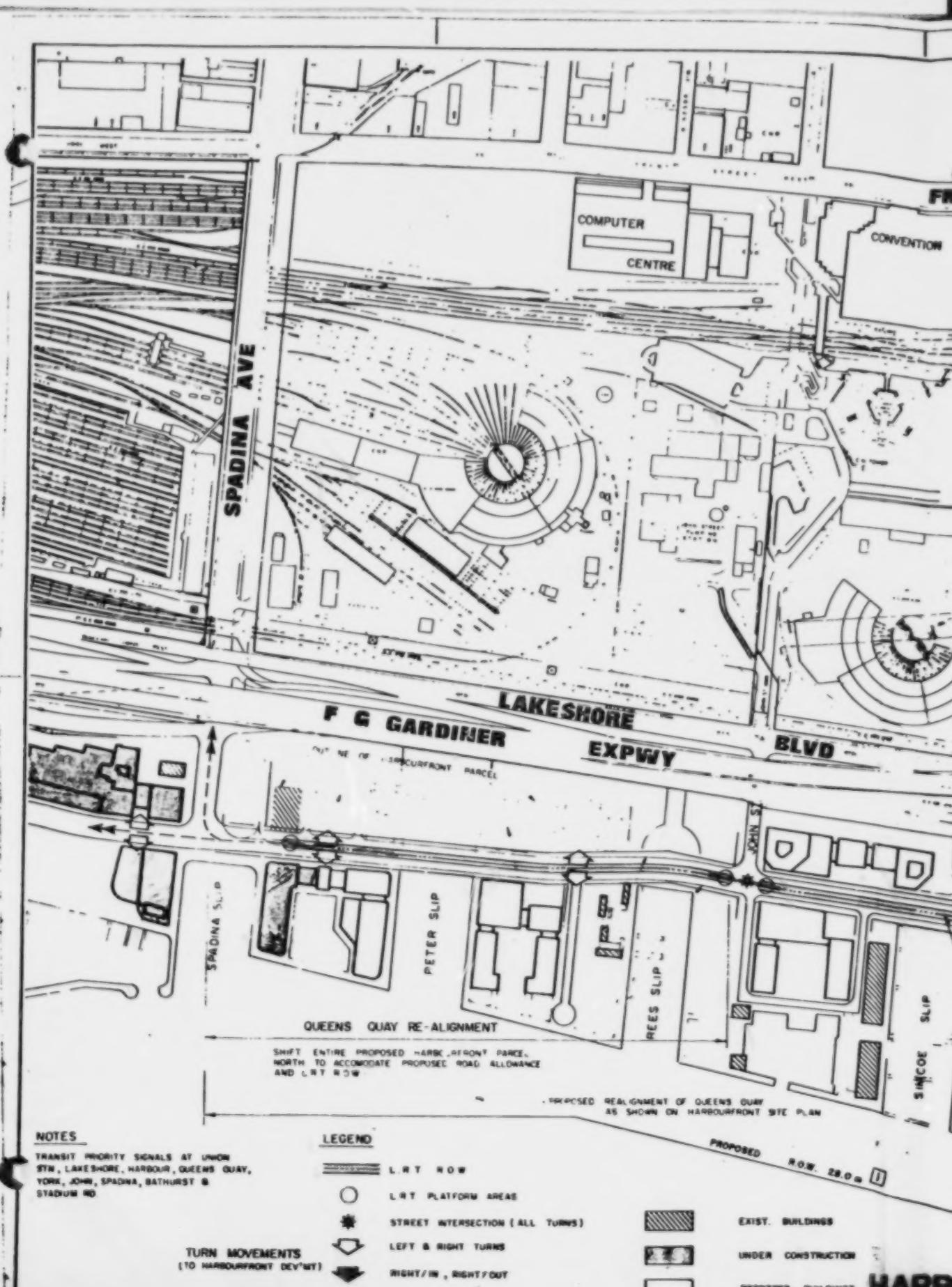


Railway lands

Harbourfront

EXHIBIT 1

WATERFRONT AREA KEY MAP


COMPUTER CENTRE
CONVENTION
SPADINA AVE
F G GARDINER EXPWY
LAKESHORE BLVD
SPADINA SLIP
PETER SLIP
REES SLIP
SIMCOE SLIP
QUEENS QUAY RE-ALIGNMENT
SHIFT ENTIRE PROPOSED HARBOURFRONT PARCEL NORTH TO ACCOMODATE PROPOSED ROAD ALLOWANCE AND LRT ROW
PROPOSED REALIGNMENT OF QUEENS QUAY AS SHOWN ON HARBOURFRONT SITE PLAN
PROPOSED ROW. 28.0 m
NOTES
TRANSIT PRIORITY SIGNALS AT UNION STN, LAKESHORE, HARBOUR, QUEENS QUAY, YORK, JOHN, SPADINA, BATHURST & STADIUM RD
TURN MOVEMENTS (TO HARBOURFRONT DEV'MT)
LEGEND
LRT ROW
LRT PLATFORM AREAS
STREET INTERSECTION (ALL TURNS)
LEFT & RIGHT TURNS
RIGHT/IN, RIGHT/OUT
EXIST. BUILDINGS
UNDER CONSTRUCTION
PROPOSED BUILDINGS
HARB

WELLINGTON
ONT ST
CENTRE
UNION
STATION
TORONTO TERMINAL RAILWAYS
YORK ST
YONGE ST
QUEENS
E L.R.T
QUAY
OURFRONT L R T

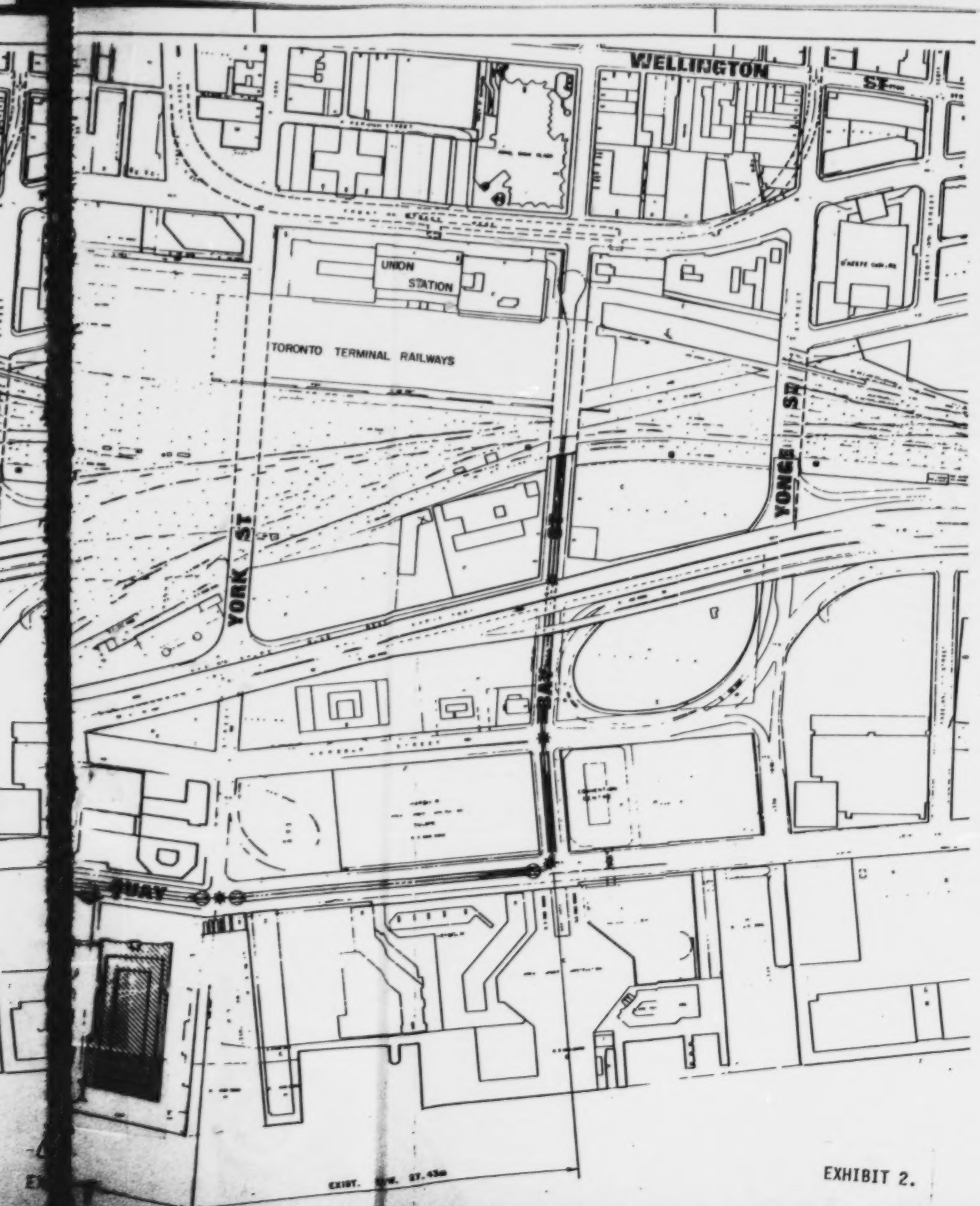

WELLINGTON
ST
UNION
STATION
TORONTO TERMINAL RAILWAYS
YORK ST
YONGE ST
BAY
QUAY

EXHIBIT 2.

Exhibit 3

Harbourfront LRT
LRT - Initial Capital Cost Estimates
(costs in millions of 1983 dollars)

	Original November 1984 Estimate	Revised March 1985 Estimate	PCC Option (Refurbished Vehicles)	PCC Option (No refurbishment)
Union Station	17.0	17.0	17.0	17.0
Trackwork	6.0	6.0	6.0	6.0
Bay Street Widening	1.5	1.5	1.5	1.5
Service Connection	2.5	2.5	2.5	2.5
Property	2.5	1.2(1)	1.2(1)	1.2(1)
Rolling stock	17.5	8.8(2)	3.5(3)	-
Sub Total	47.0	37.0	31.7	28.2
Spadina Bridge (Support)	5.0	-	-	-
Total	52.0	37.0	31.7(4)	28.2(4)

(1) Property costs reduced by $1.3 million, land donated by Harbourfront for Spadina/Queen's Quay loop.
(2) Reduced demand levels allow reduction in rolling stock from 10 to 5 ALRVs.
(3) Assumes refurbishment cost of $440,000.00 per vehicle, for 8 vehicles.
(4) Future capital cost of 5 ALRV's to be purchased in approximately 5 years, is not included.

Exhibit 4

Harbourfront LRT
Busway Cost Estimates
(Capital costs in millions of 1983 Dollars)

	Trolley Coach Upgraded to LRT			Diesel Bus Upgraded to LRT		
	First Stage	Final Stage	Total	First Stage	Final Stage	Total
Union Station	17.0	-	17.0	16.7	3.3	20.0
Trackwork (Bus Lanes)	5.4	4.0	9.4	3.4	6.0	9.4
Bay Street Widening	1.5	-	1.5	1.5	-	1.5
Service Connection	-	-	-	-	-	-
Property	1.2 (1)	-	1.2 (1)	1.2 (1)	-	1.2
Rolling Stock	1.8 (2)	8.8 (3)	12.3	1.0 (4)	8.8 (3)	11.5
Sub Total	26.9	12.8	39.7	23.8	18.1	41.9
Spadina Bridge (Support)	-	-	-	-	-	-
Total	26.9	12.8	39.7	23.8	18.1	41.9

(1) Property costs reduced by $1.3 million, land donated by Harbourfront for Spadina/Queen's Quay loop.
(2) Cost of 6 new trolley coaches at $300,000.00 per vehicle, salvage value not included.
(3) Reduced demand levels allow reduction in rolling stock from 10 to 5 ALRVs.
(4) Cost of 6 new diesel buses at $160,000.00 per vehicle.

Exhibit 5

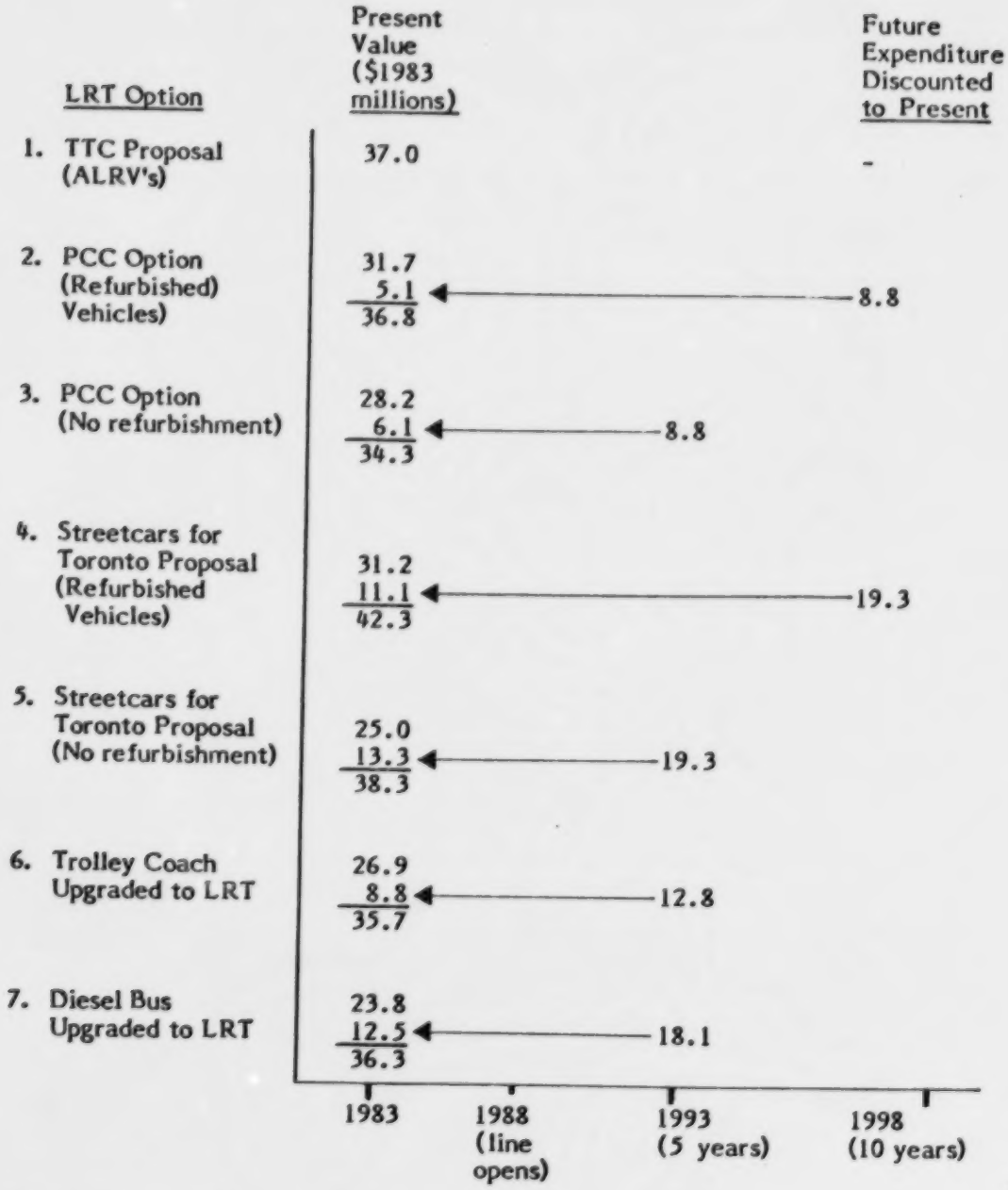
Harbourfront LRT
Streetcars For Toronto Committee Proposal Cost Estimates
(Capital costs in millions of 1983 dollars)

	Option 1. (Refurbished PCCs)	Option 2. (No refurbishment)
Union Station (1)	6.3	6.3
Trackwork	10.6	10.6
Bay Street Widening	1.5	1.5
Service Connection (2)	1.2	1.2
Property (3)	5.4	5.4
Rolling Stock (4)	6.2	-
Sub Total	31.2	25.0
Spadina Bridge (Support)	-	-
Total	31.2	25.0

(1) Cost of access from Front Street to Union Station mezzanine.
(2) Service track from Peter/Front to Spadina/King.
(3) Includes $4,000,000.00 for off-street loop at Peter Street and Front Street.
(4) Cost of 15 refurbished PCC cars at $410,000.00 per vehicle. Per vehicle refurbishment costs are lower than for the current proposal (i.e. 8 vehicles at $440,000.00 per vehicle) due to the larger fleet, allowing economies of scale to be realized.

Exhibit 6

Net Present Value Comparison



Inflation rate of 6 per cent. per annum and discount rate of 10 per cent. per annum used in all cases

Exhibit 7
Traffic Impacts of Harbourfront Transit Options

	LRT Median Separate	Streetcar Mixed Traffic	Reserved Bus Curb Lane Separate	Reserved Bus Curb Lane RT Turn Allowed	Bus Mixed Traffic
Total Curb to Curb R.O.W.	21.64m midblock 22.71m intersection	21.64m midblock 22.71m intersection	21.95m	21.95m	21.95m
Lane Configuration	1 Transit 1 Left or Through 1 Right & Through	1 Transit shared 1 Left shared 1 Through 1 Right & Through	1 Transit 1 Left and Through 1 Right & Through	1 Transit shared 1 Left 1 Through 1 Right Shared	1 Transit shared 1 Left 1 Through
Number of Basic Signal Phases Required (Advanced Green Not Incl.)	3	2	3	2	2
Conformity to Normal Operations	U turns at intersections Left turns from other than left lane		Right turns from other than curb lane		
Transit Passengers Interfering with Traffic	Yes	Yes	No	Limited - Dwell times	Limited - Dwell times
Ranking*					
Traffic Operations (Congestion)	4 or 5	2 or 3	4 or 5	2 or 3	1
Transit Operation (Speed & Consistent) Headway	1	4	2	3	5
Total (Non Weighted)	2.5/3	3/3.5	3/3.5	2.5/3	3

*Note: Ranking Key: 1 = Best 5 = Worst

Exhibit 8

Evaluation Summary

Harbourfront L.R.T. Options

Criteria	TTC Proposal	PCC Option	Mixed Traffic Option (Streetcars for Toronto Proposal)	Trolley coach Upgraded to LRT Option	Diesel Bus Upgraded to LRT Option
Transit Service Level	Very Good	Good	Fair/Poor	Very Good	Very Good
Initial Capital Cost (millions of 1983 dollars)	37.0	28.2 (31.7)*	25.0 (31.2)*	26.9	23.8
Total Capital Cost (millions of 1983 dollars)	37.0 (As revised)	34.3 (36.8)*	38.3 (42.3)*	35.7	36.3
Annual Operating Cost	Very Good	Good	Fair/Poor	Good	Good
Traffic impacts	Fair	Fair	Poor	Fair	Fair
Requirements for Official Plan Amendment	Yes	Yes	Yes	Not initially	Not initially
Disruption during Construction	Only once	Only once	Only once	requires a second period of disruption for upgrading	requires a second period of disruption for upgrading

* Costs in parenthesis assume refurbishment of PCCs.

Exhibit 9

Harbourfront LRT - Recommended Option
T.T.C. Capital Works Program Impact[1]
(Costs in millions of inflated dolalrs)

	1984	1985	1986	1987	1988	Post 1988[2]	Total
Provincial Share	0.37	3.82	27.00	12.30	1.05	12.75	57.29
Metropolitan Share	0.13	1.28	9.00	4.10	0.35	4.25	19.11
TOTAL	0.50	5.10	36.00	16.40	1.40	17.00	76.40

1. Assumes phasing is as presented in 1985 T.T.C. Capital Works Program. Subject to revision pending timing of Council approvals.

2. Assumes acquisition of five ALRV's for delivery in 1993.

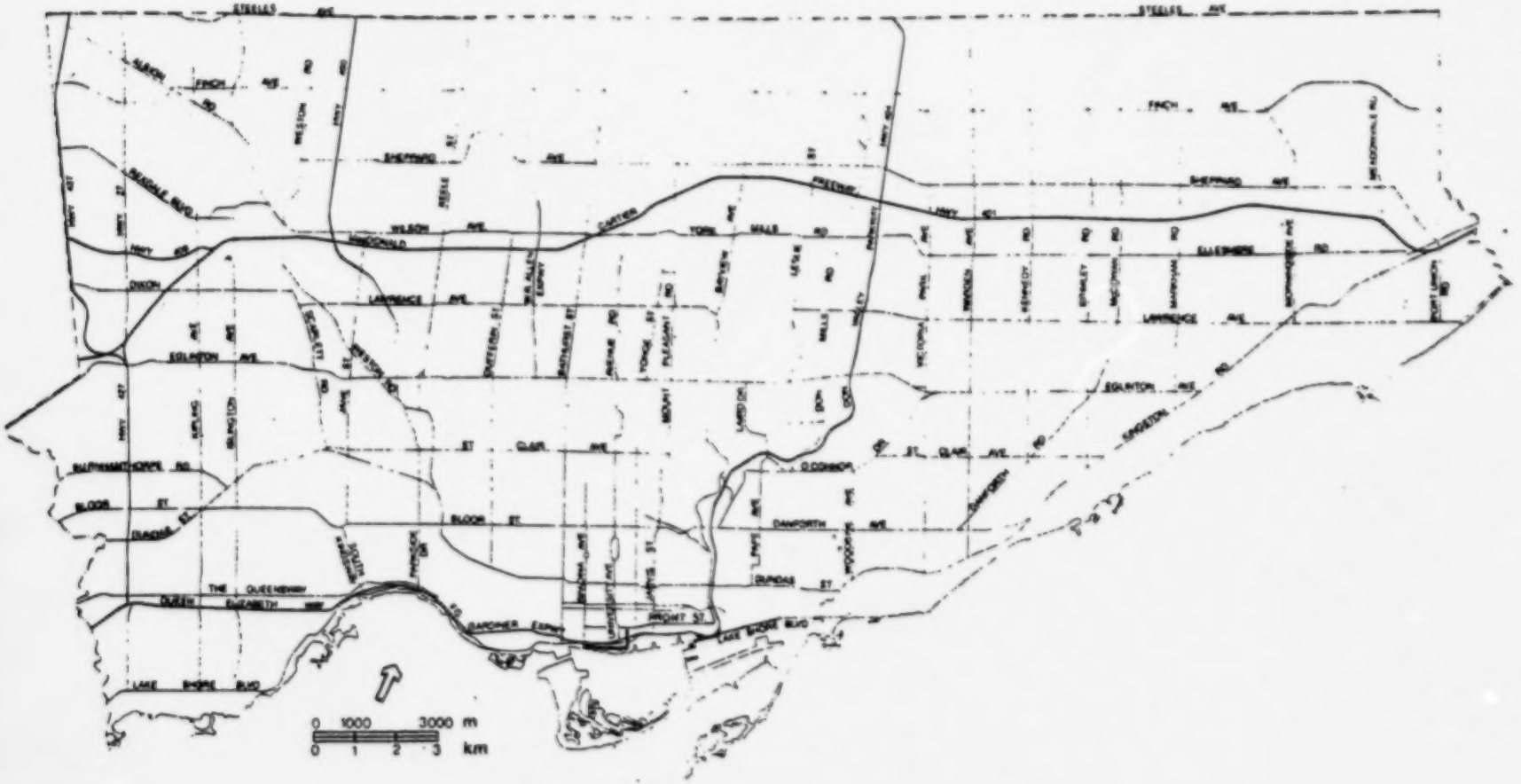
AMENDMENT NO._____

To

The Official Plan for the
Metropolitan Toronto Planning Area

1. Figures 3 and 5 of the Plan are amended by adding thereto the rapid transit line indicated on Schedule "A.1" hereto attached.

2. Figure 7 of the Plan is amended by adding thereto the committed light rail transit line indicated on Schedule "A.1" hereto attached.


STEELES AVE
FINCH AVE
SHEPPARD AVE
WILSON AVE
LAWRENCE AVE
EGLINTON AVE
ST CLAIR AVE
BLOOR ST
DANFORTH AVE
DUNDAS ST
QUEEN ELIZABETH WAY
THE QUEENSWAY
GARDINER EXPWAY
LAKE SHORE BLVD
DON VALLEY PKWY
DON MILLS RD
YONGE ST
BAYVIEW AVE
O'CONNOR DR
0 1000 3000 m
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SCHEDULE A.1

TORONTO TRANSIT COMMISSION

JULIAN PORTER, Q.C.
CHAIRMAN

JEFFERY S. LYONS, Q.C.
VICE-CHAIRMAN

GORDON J. CHONG
C. DENNIS FLYNN
JUNE ROWLANDS
COMMISSIONERS

ALFRED H. SAVAGE
CHIEF GENERAL MANAGER

DAVID C. PHILLIPS
GENERAL SECRETARY

November 9, 1984

Mr. W.J. Lotto
Metropolitan Clerk
The Municipality of
Metropolitan Toronto
2nd Floor, City Hall
Toronto, Ontario
M5H 2N2

Dear Mr. Lotto:

Further to my letter of October 31st regarding the Commission's proposal for transit services to Harbourfront, I wish to advise that the motion regarding this matter has been revised as follows:

> The Commission endorsed the proposal to build the Harbourfront LRT as put forward by staff, subject to required provincial approvals and necessary amendments to the Metro General Plan.
>
> The Commission authorized that the writer request the Metropolitan Clerk that the Commission would appreciate the opportunity of reviewing this entire project with the Metropolitan Council at the earliest possible date.

I have underlined the amendment to this motion for your information and attention.

Yours very truly,

Assistant
General Secretary

1-81-32

Copy to: Mr. C.D. Flynn
Metropolitan Chairman

1900 Yonge Street, Toronto, Canada, M4S 1Z2 Telephone (416) 481-4252 Telex: 06524670

TORONTO TRANSIT COMMISSION

JULIAN PORTER, Q.C.
CHAIRMAN

JEFFERY S. LYONS, Q.C.
VICE-CHAIRMAN

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C. DENNIS FLYNN
JUNE ROWLANDS
COMMISSIONERS

ALFRED H. SAVAGE
CHIEF GENERAL MANAGER

DAVID C. PHILLIPS
GENERAL SECRETARY

2a

November 13, 1984

Mr. W.J. Lotto
Metropolitan Toronto Clerk
The Municipality of
Metropolitan Toronto
2nd Floor, City Hall
TORONTO, Ontario
M5H 2N2

Dear Mr. Lotto:

At its meeting on Tuesday, November 13, the Commission considered and approved the attached report entitled, "Harbourfront LRT."

The Commission recommends that Council approve proceeding with the Harbourfront LRT project at an estimated final cost of $70,200,000.

The attached report makes reference to copies of a presentation dated November 4, 1984. As this presentation was previously forwarded to Council, copies are not attached to the report as indicated.

Yours very truly,

Assistant
General Secretary

1-83-32

1900 Yonge Street, Toronto, Canada, M4S 1Z2 Telephone (416) 481-4252 Telex: 06524570

Form 001/A0: May 82

TORONTO TRANSIT COMMISSION

MEETING DATE November 13, 1984

DATE November 7, 1984 REPORT NO. 5

SUBJECT HARBOURFRONT LRT

RECOMMENDATION

It is recommended that this report be forwarded to Metro Council in order to get Council approval to proceed with the Harbourfront LRT project at an estimated final cost of $70,200,000.

(A.H.S.) (S.T.L.) (J.H.J.)

HISTORY

At its meeting on September 6, 1983, the Commission authorized that:

"- subject to Metro Council approval the Commission authorize $500,000.00 for the preparation of detailed contract documents for the Harbourfront LRT project;

- this report be forwarded to Metro Council in order to get Council approval to proceed with the Harbourfront LRT portion of project #32 Design and Engineering - Future Lines, and

- Metropolitan Council instruct the Metropolitan Property Department to work with the TTC to acquire the rights necessary in the Union Railway Station and for the widening of portions of Queens Quay to accommodate the LRT right-of-way."

The foregoing report noted that "the line will proceed south on Bay Street to Queens Quay, then west to a turnback loop at Spadina and Lakeshore Boulevard, utilizing a private right-of-way in the centre of these streets. This private right-of-way will be separated from the adjacent traffic lanes by raised curbs; will have transit priority signals at the major intersections and will

HARBOURFRONT LRT

restrict other street connections to right turn in right turn out traffic movements only."

It was also noted that an order of magnitude estimate for the Harbourfront LRT project was $29 million, which would be either confirmed or corrected in a later report to the Commission when engineering studies were completed.

A study of the Harbourfront LRT project was completed, and was forwarded to the Commission at its meeting on March 20, 1984. This study showed that to provide for the projected high level of passenger demand it was necessary to incorporate:

- fully integrated transfer facilities with the Yonge and University subways at Union Station;

- full right-of-way protection;

- measures to ensure adequate intersection operation."

The study also proposed the use of standard curbs to ensure a dedicated right-of-way and limited the number of locations where turns would be permitted by vehicular traffic to major intersections and one other location per block.

At that time the Commission was informed that the cost of this project in 1983 dollars was $37,500,000 or approximately $62,000,000 in inflated dollars which includes an allowance of $7,000,000 for improvements to Spadina bridge to provide vehicle access to the Harbourfront line.

At the March 20, 1984 meeting, the Commission also authorized interim funds in the amount of $500,000 for detailed design engineering of the Harbourfront LRT in accordance with the attached Engineering and Construction Branch report dated February, 1984.

Costs of this work would be charged to the Special Project accounts, until the Capital Works Programme received approval from Metropolitan Toronto Council and the Ontario Municipal Board. When the necessary approvals are received, the charges would then be transferred to the approved project.

HARBOURFRONT LRT

DISCUSSION

Previous Harbourfront LRT reports indicated that the Union Station loop would consist of 300 meters of surface track and a two car platform within the TTR building, requiring minimal modifications to the building and bridge. It was always recognized that this scheme posed a variety of major problems. A loop constructed at grade would result in substandard traffic lanes, require major structural changes, interfere with TTR parking and GO facilities, interfere with the moat entrance to the building and require sidewalk relocation.

It is now recommended that for added efficiency and in order to alleviate the aforementioned problems, that the Union Station loop be designed as 370 meters of underground box structures and station with a connecting pedestrian passage to the TTR building including associated, necessary utility relocations. The underground loop would open to a portal on Bay Street south of Union Station. This scheme would increase the current estimate for the Harbourfront LRT project by approximately $10.5 million but is justifiable when the benefits are considered.

Property costs resulting from this underground proposal would decrease the current estimate by approximately $1.0 million. Property requirements are reduced from 2800 square meters in fee to 1530 square meters in fee and 600 square meters in underground easements. In addition, it should be noted that Harbourfront may contribute property to the Spadina loop which would result in an approximate cost saving of $1.3 million to the project. Should these discussions lead to a favourable conclusion, the result would be conveyed to the Commission as the subject of a separate report.

Attached hereto are copies of a presentation dated November, 1984 prepared by the Engineering and Construction Branch. This report sets out details of the proposed underground Union Station loop and other additional alignment information. A current estimate in the amount of $52,000,000 based on 1983 dollars is also included. It is anticipated that in inflated dollars, the cost of this project will increase to approximately $70,200,000 or an increase of $8,200,000 to the amount included in the Commission's Capital Works Programme which was approved by Metro Council on Feburary 28, 1984.

HARBOURFRONT LRT

JUSTIFICATION

Detailed design of this project must be commenced without further delay in order to meet the proposed schedule. Unless this is started immediatley, construction will be delayed and in turn, costs will continue to increase.

A considerable portion of the development to be served by the LRT line is in place and traffic congestion presently being experienced has made the implementation of this facility an immediate requirement.

8.115.66

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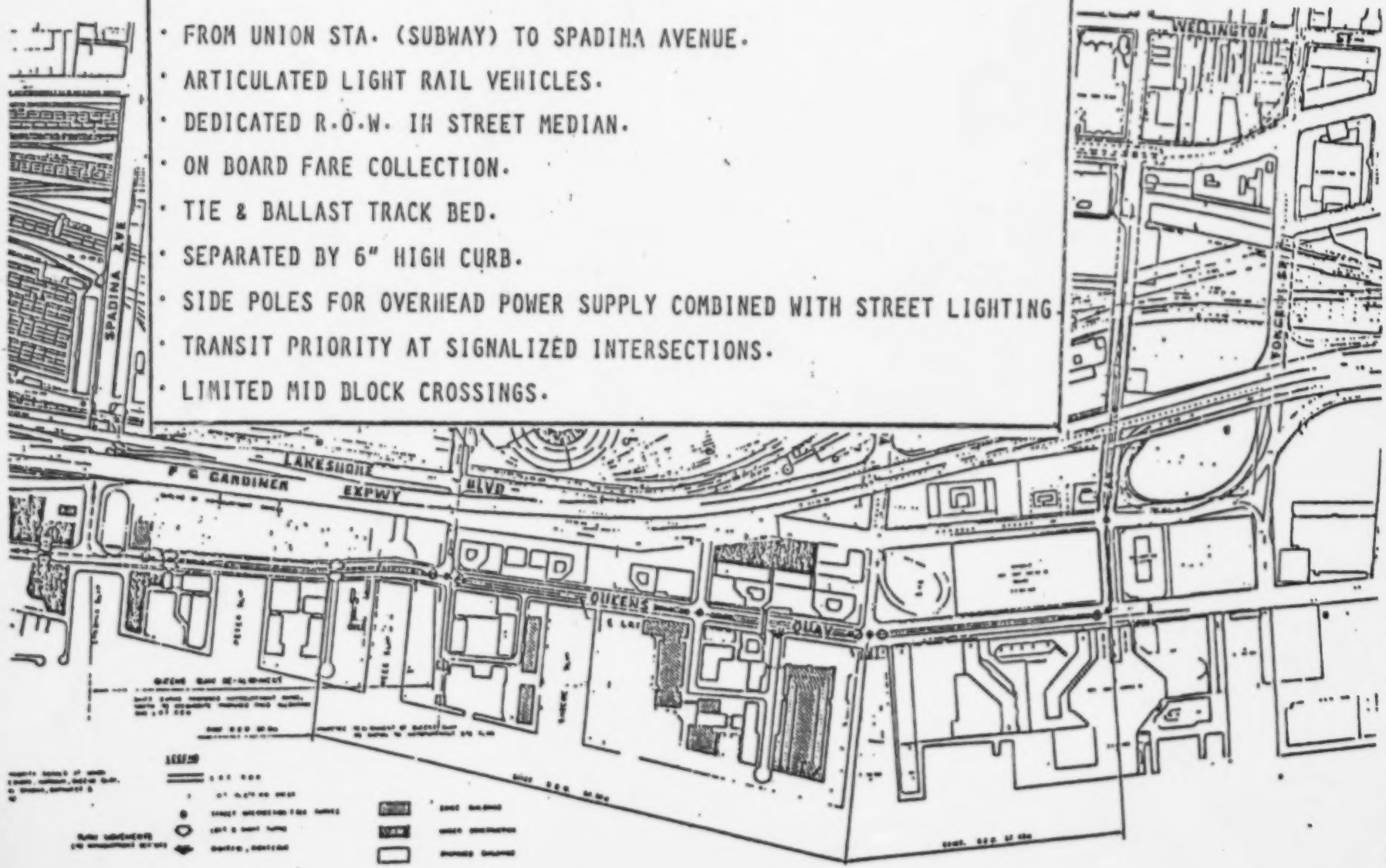
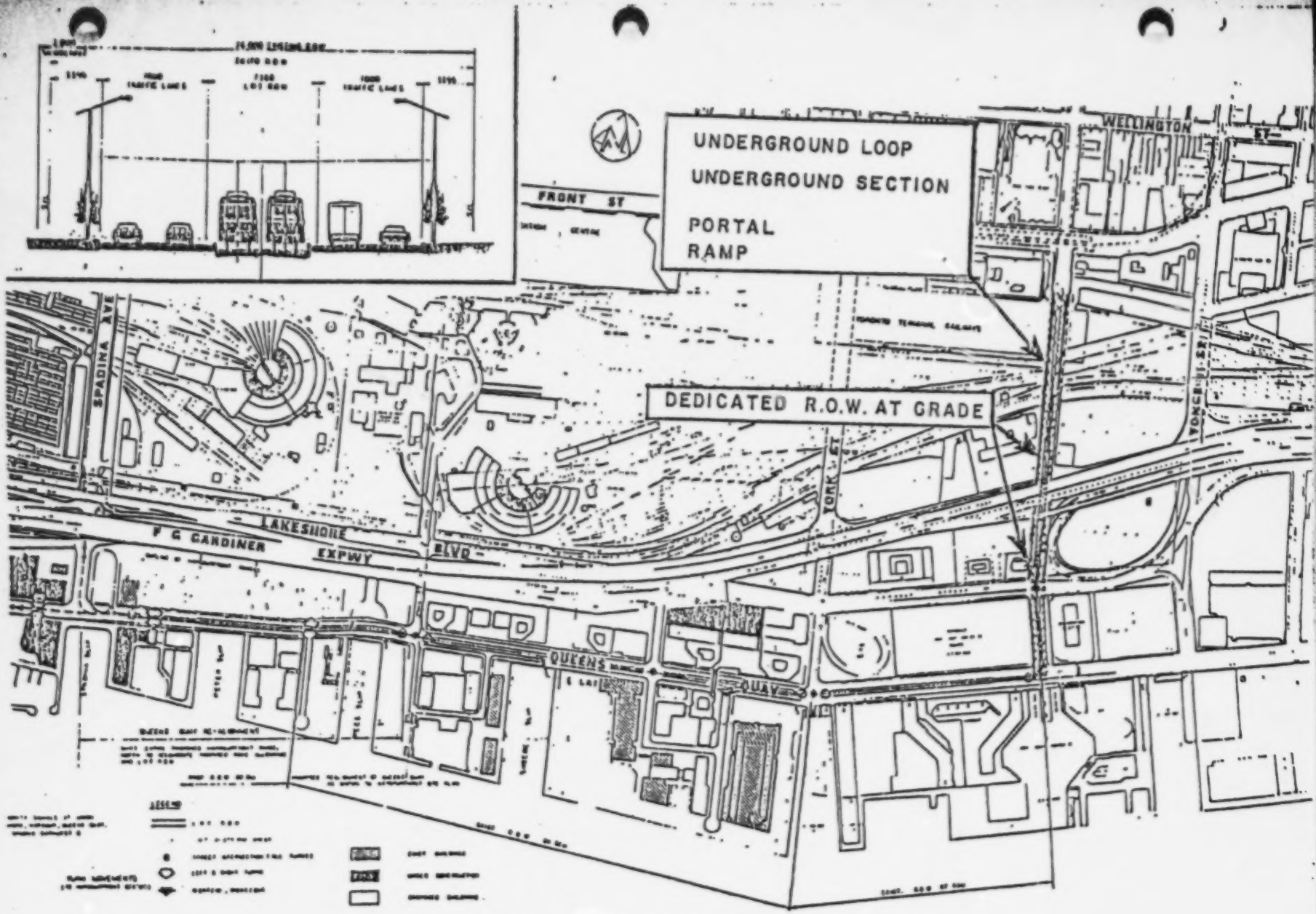
HARBOURFRONT LRT

GENERAL FEATURES

- FROM UNION STA. (SUBWAY) TO SPADINA AVENUE.
- ARTICULATED LIGHT RAIL VEHICLES.
- DEDICATED R.O.W. IN STREET MEDIAN.
- ON BOARD FARE COLLECTION.
- TIE & BALLAST TRACK BED.
- SEPARATED BY 6" HIGH CURB.
- SIDE POLES FOR OVERHEAD POWER SUPPLY COMBINED WITH STREET LIGHTING.
- TRANSIT PRIORITY AT SIGNALIZED INTERSECTIONS.
- LIMITED MID BLOCK CROSSINGS.

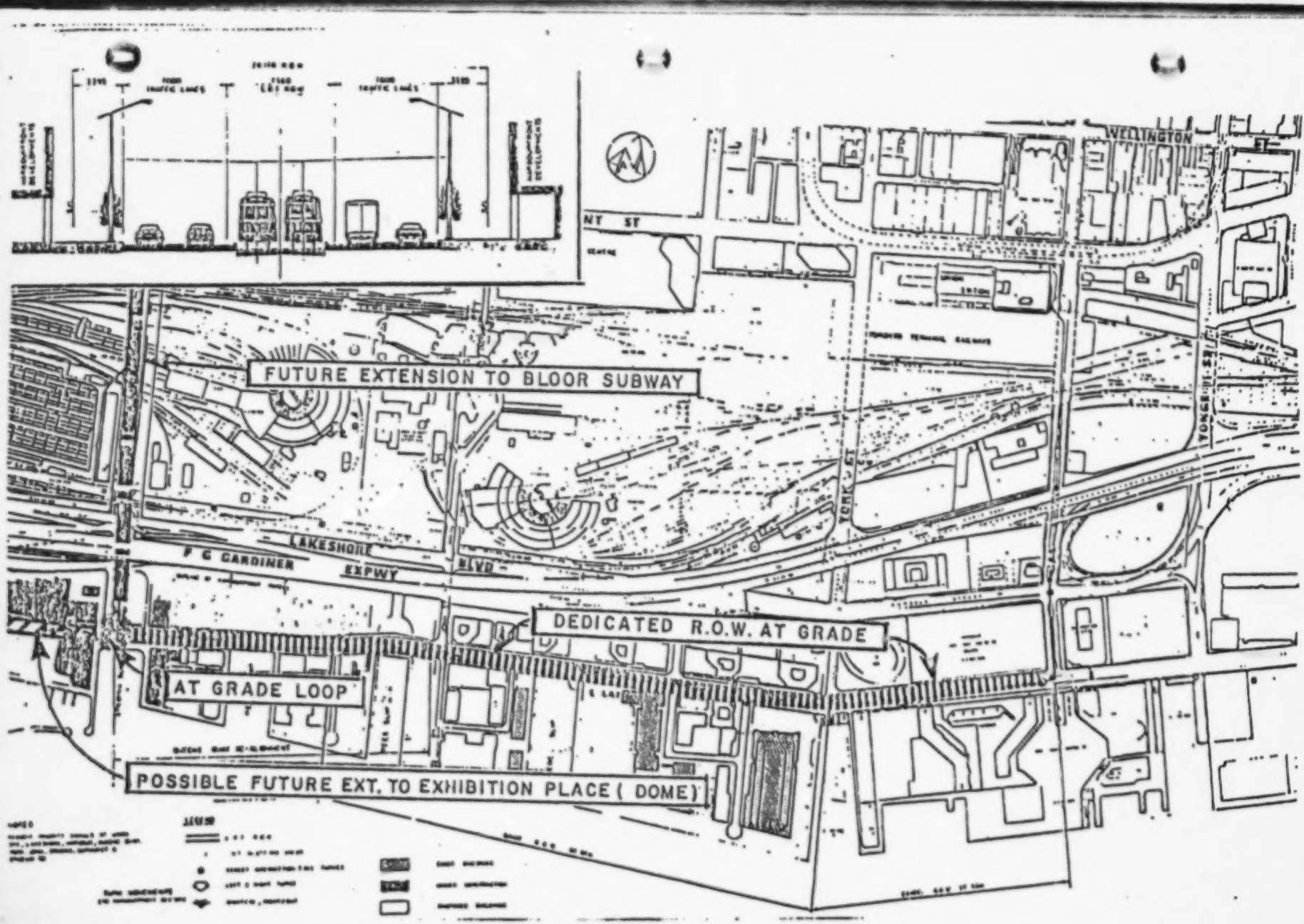


HARBOURFRONT L R T



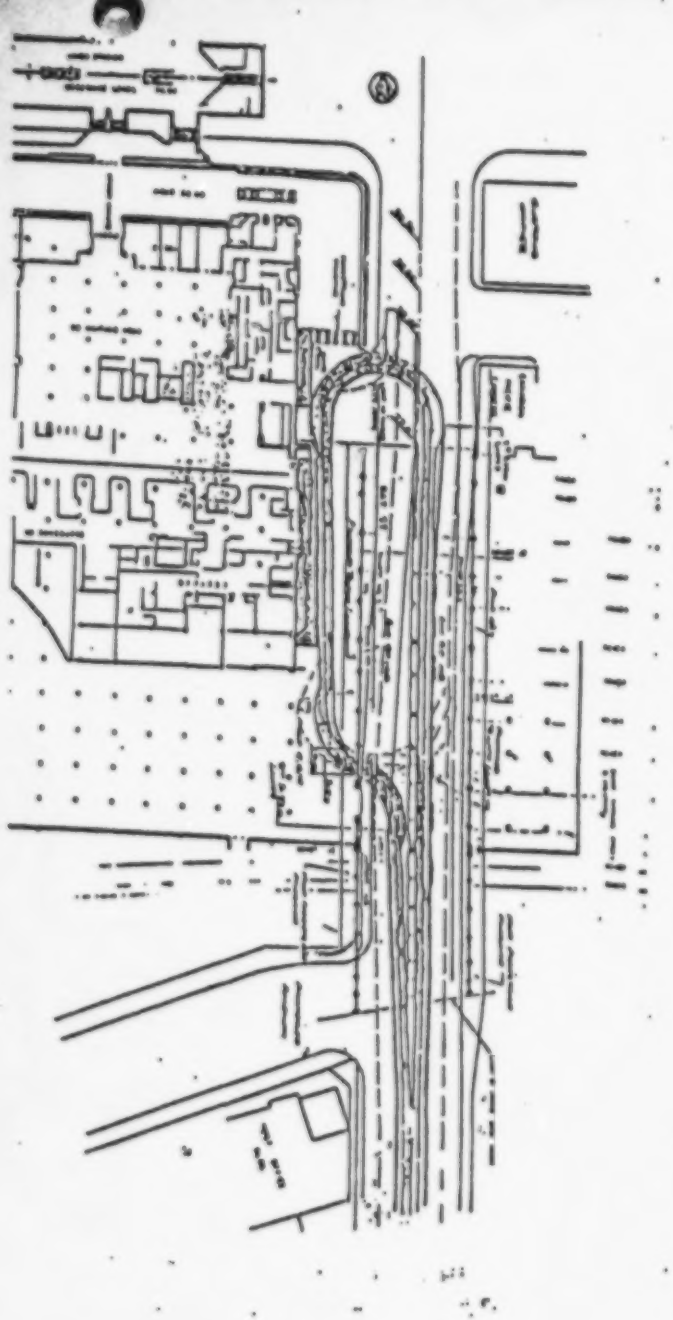
HARBOURFRONT L R T

(BAY ST. PORTION)



HARBOURFRONT L R T

(QUEEN'S QUAY PORTION)



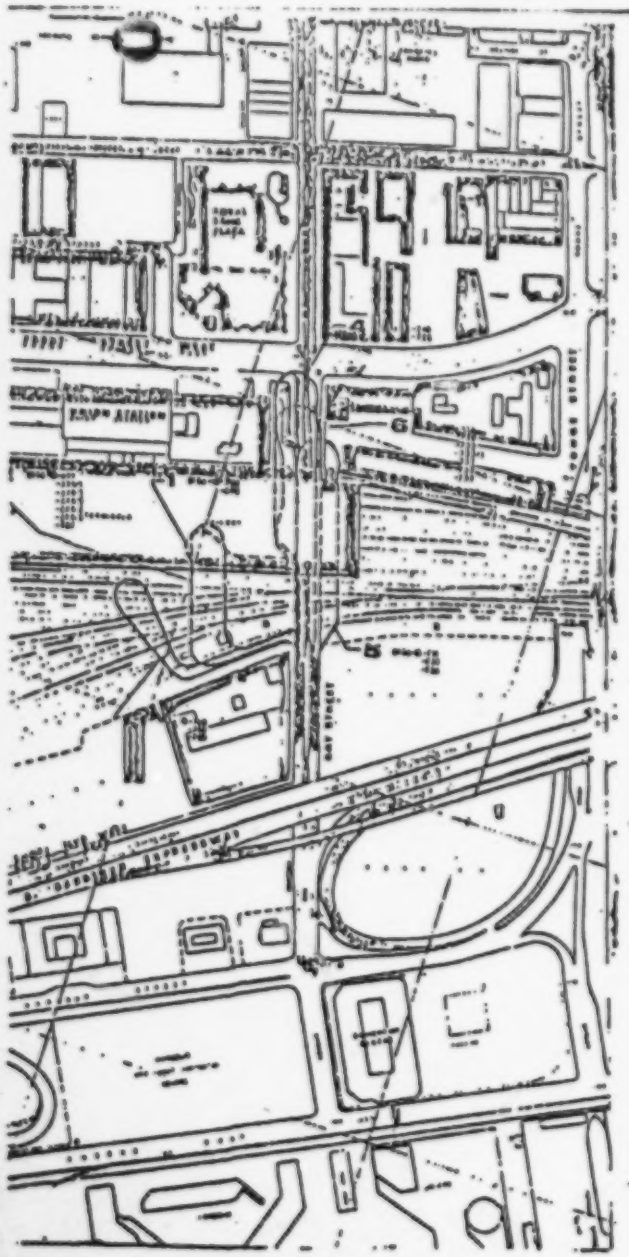
ORIGINAL AT GRADE LOOP AT UNION STATION

(BASIS FOR BUDGET ESTIMATE)

PROBLEMS WITH PROPOSAL

1) SUBSTANDARD TRAFFIC LANES.
2) REQUIRES MAJOR STRUCTURAL CHANGES.
3) INTERFERES WITH TTR PARKING.
4) INTERFERES WITH GO FACILITIES.
5) INTERFERES WITH ENTRANCE TO MOAT.
6) SIDEWALKS HAVE TO BE RELOCATED.

CONCLUSION - PROPOSAL NOT PRACTICAL TO IMPLEMENT BECAUSE OF IMPACT ON TTR FACILITIES.



DISADVANTAGES

OPTIONS 2 & 3

- DEPENDENT ON DEVELOPMENT OF THE RAILWAY LANDS
- POOR PASSENGER ACCESS TO UNION STATION

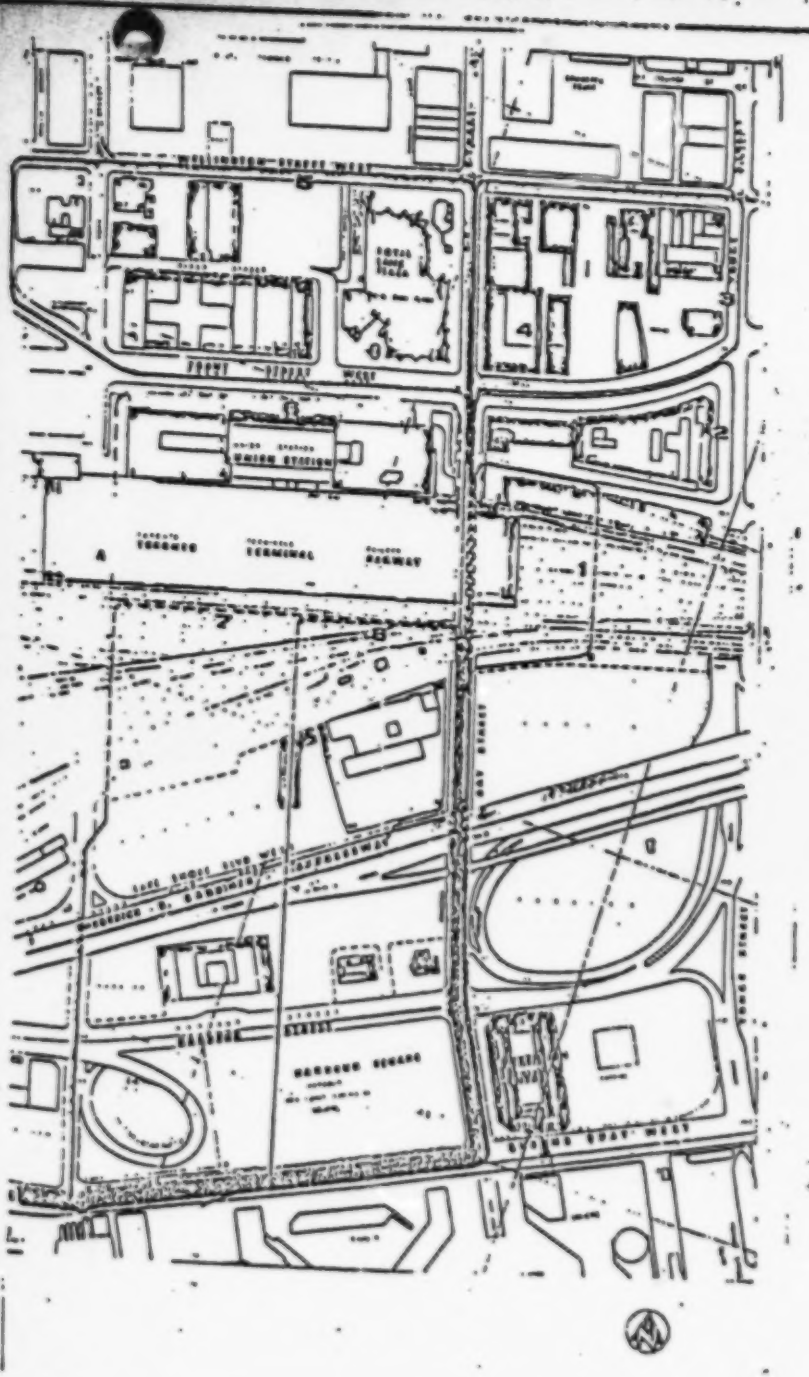
OPTIONS 1 & 5

- POOR ACCESS TO UNION STATION
- INTERFERE WITH EXISTING FACILITIES

OPTIONS 4 & 6

- INTERFERE WITH EXISTING FACILITIES

UNDERGROUND LOOP OPTIONS ON RAILWAY LANDS



DISADVANTAGES

OPTIONS 1, 7 & 8

- DEPEND ON AVAILABILITY OF PROPERTY
- POOR PASSENGER ACCESS TO UNION STATION
- REQUIRE MAJOR STRUCTURAL CHANGES

OPTIONS 2, 4 & 6

- DEPEND ON AVAILABILITY OF PROPERTY
- MIXED TRAFFIC
- REQUIRE MAJOR STRUCTURAL CHANGES

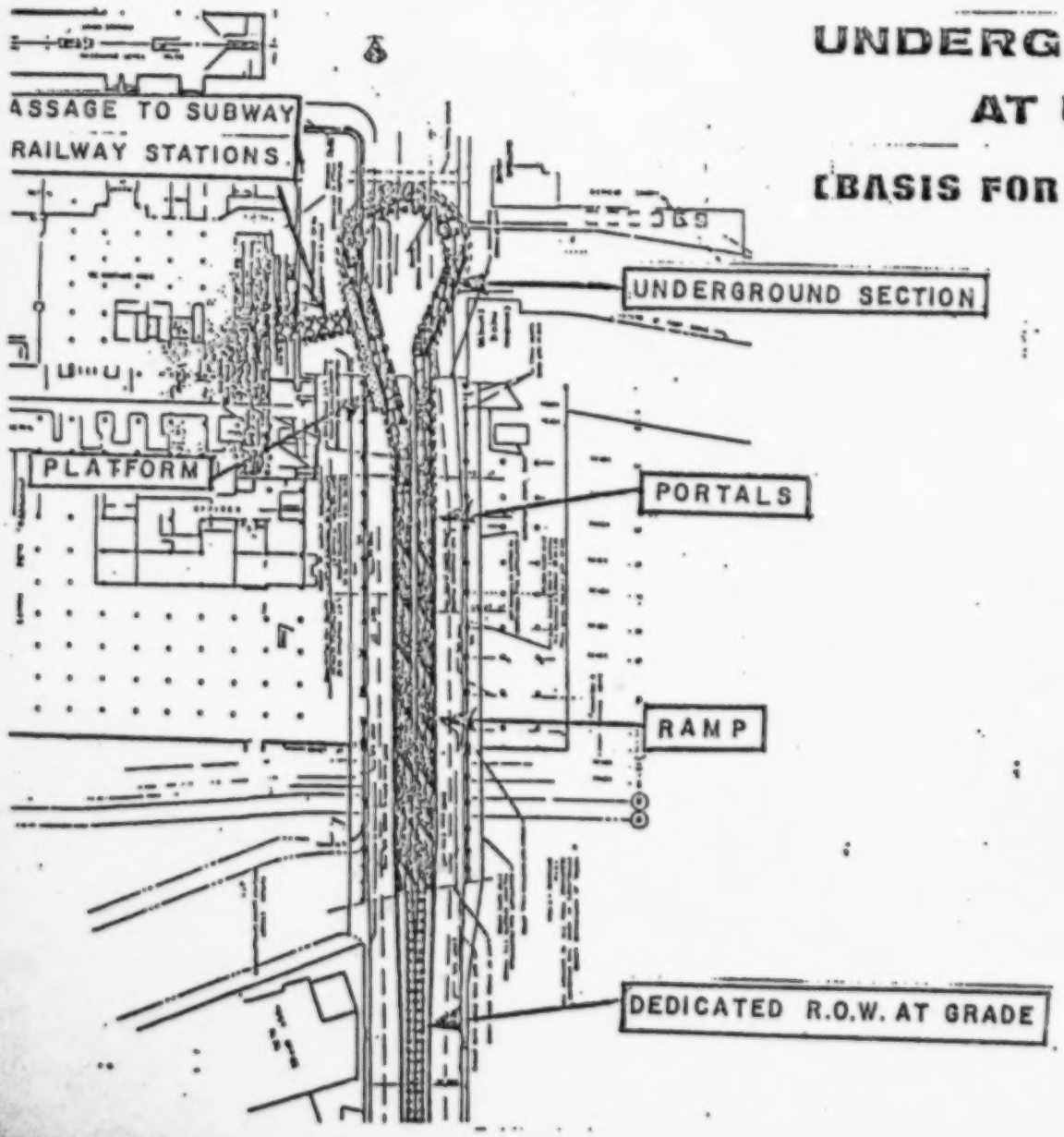
OPTIONS 3 & 5

- MIXED TRAFFIC
- INTRODUCE HIGH ADDITIONAL MILEAGE
- REQUIRE MAJOR STRUCTURAL CHANGES

OTHER LOOP OPTIONS

UNDERGROUND LOOP OPTION AT UNION STATION

(BASIS FOR CURRENT BUDGET ESTIMATE)



AVOIDS MOST OF THE PROBLEMS ASSOCIATED WITH THE ORIGINAL PROPOSAL AND HAS MINIMAL IMPACT ON TTR FACILITIES.

LRT Summary — Cost Comparisons (Costs in Millions of 1983 dollars)

	Budget Estimate	Current Estimate
Union Station	6.5	17.0
Trackwork	6.0	6.0
Road widening	1.5	1.5
Service connection	2.5	2.5
Property	3.5	2.5
Rolling Stock	17.5	17.5
Sub-total	37.5	47.0
Spadina Bridge (Support)	*	5.0
Total 1983 Dollars	37.5	52.0

*Allowance not included in original report.

Common Cost Items Include:

Trackwork ($6.0 m)

- Trackbed preparation, Track, Substation Equipment & Building, Overhead Power, Utilities, Priority Signals

Road Widening ($1.5 m)

- 2 additional lanes on Bay, sidewalks, curbs, gutters, utility work

Service Connection ($2.5 m)

- Two track connection to existing streetcar trackage

Rolling Stock ($17.5 m)

- 15 CLRV's or 10 ALRV's to carry up to 6000 pphpd
- Deadline to increase present ALRV order is January 31, 1985.

Cost Variance Between Budget and Current Estimates

Union Station ($6.5 m vs $17.0 m)

- ($6.5 m) 300 meters of Surface Track and a two car platform within TTR building with minimal modifications to building and bridge.
- ($17.0 m) 370 meters of Underground box structures and station with connecting pedestrian passage to TTR building, decking of street, utilities, relocation of storm and sanitary sewers.

Cost Variance Between Budget and Current Estimates (cont'd.)

Property ($3.5 m vs $2.5 m)

- ($3.5 m) relates to approximately 2800 square meters in fee
- ($2.5 m) relates to approximately 1530 square meters in fee and 600 square meters in easements (underground)

Note: Harbourfront may contribute property for Spadina Loop, — approximate cost saving $1.3 m.

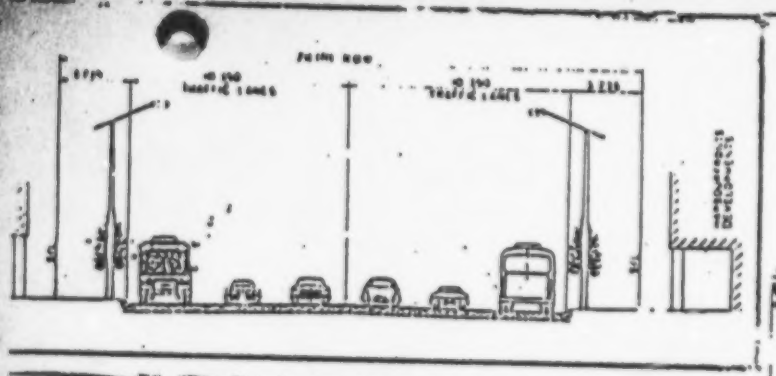
LRT Summary — Cost Comparisons

	Budget Estimate	Current Estimate
Total 1983 dollars	37.5	52.0
Total 1984 dollars	40.5	56.2
Escalated to Completion:		
At 8% (1984-1988 CWP)	62.0*	78.0
At 6% (1985-1989 CWP)	55.8	70.2

* CWP included an allowance for strengthening of Spadina bridge.

Alternatives to LRT

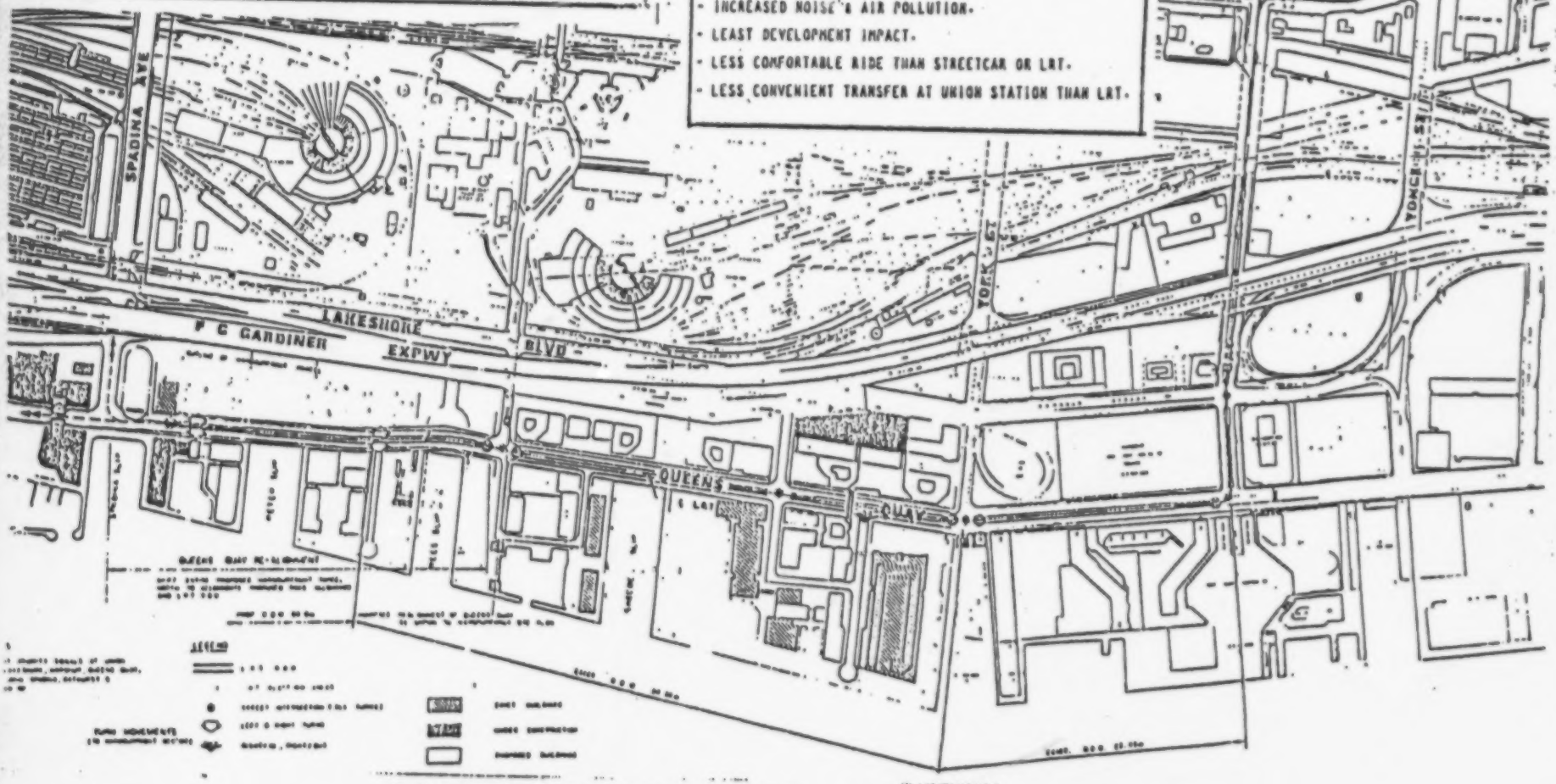
- Buses in mixed traffic
- Buses in reserved curb lanes
- Buses in dedicated centre lanes
- Streetcars in mixed traffic



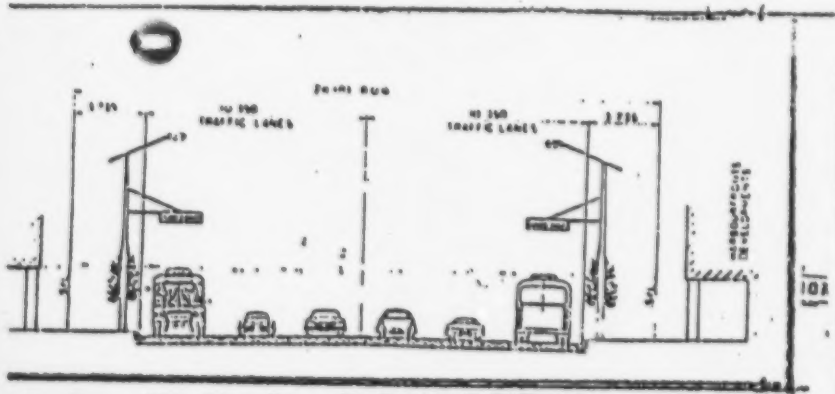
BUSES IN MIXED TRAFFIC

ADVANTAGES
- LOWEST COST.
- ALLOWS UNLIMITED ACCESS TO PROPERTIES.

DISADVANTAGES
- SLOWEST, LEAST RELIABLE SERVICE (7 MPH).
- LOWEST RIDERSHIP.
- INCREASED NOISE & AIR POLLUTION.
- LEAST DEVELOPMENT IMPACT.
- LESS COMFORTABLE RIDE THAN STREETCAR OR LRT.
- LESS CONVENIENT TRANSFER AT UNION STATION THAN LRT.



ALTERNATIVE TO LRT.
BUSES IN MIXED TRAFFIC



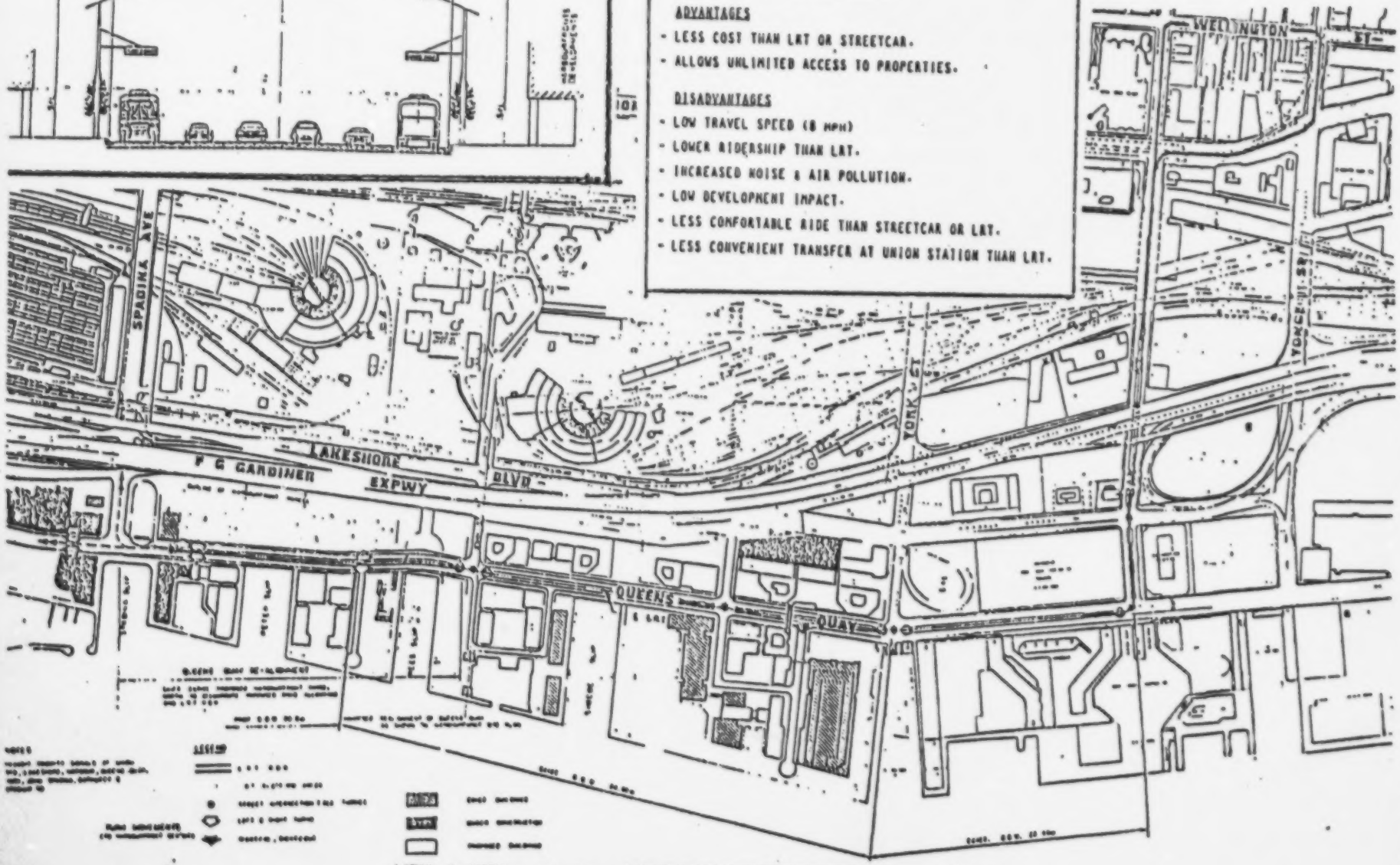
BUSES IN RESERVED CURB LANES

ADVANTAGES

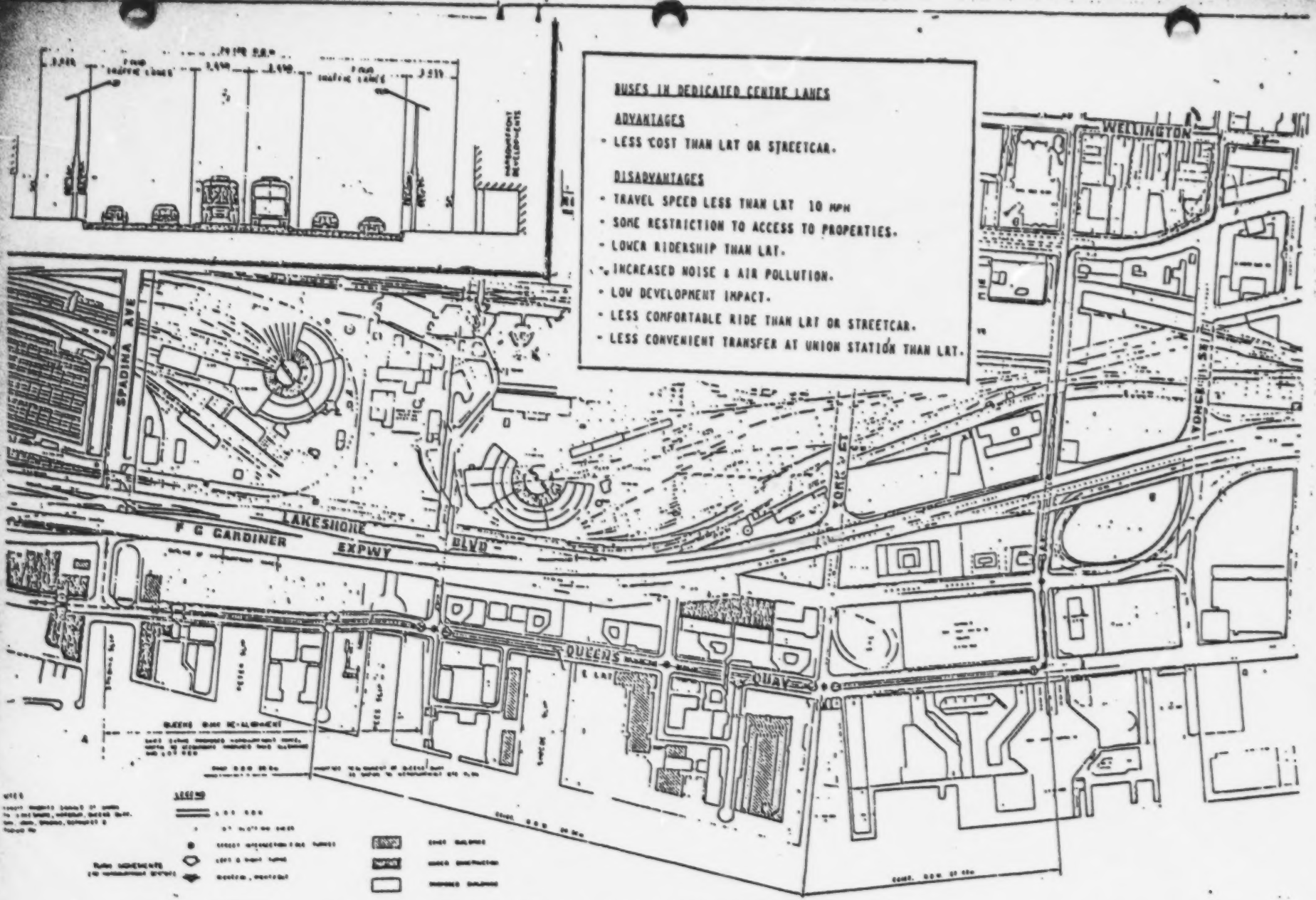
- LESS COST THAN LRT OR STREETCAR.
- ALLOWS UNLIMITED ACCESS TO PROPERTIES.

DISADVANTAGES

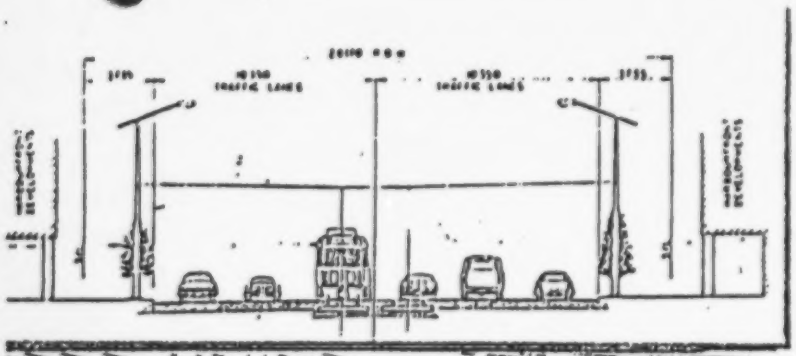
- LOW TRAVEL SPEED (8 MPH)
- LOWER RIDERSHIP THAN LRT.
- INCREASED NOISE & AIR POLLUTION.
- LOW DEVELOPMENT IMPACT.
- LESS COMFORTABLE RIDE THAN STREETCAR OR LRT.
- LESS CONVENIENT TRANSFER AT UNION STATION THAN LRT.



ALTERNATIVE TO LRT.
BUSES IN RESERVED CURB LANES


BUSES IN DEDICATED CENTRE LANES
ADVANTAGES
• LESS COST THAN LRT OR STREETCAR.
DISADVANTAGES
• TRAVEL SPEED LESS THAN LRT 10 MPH
• SOME RESTRICTION TO ACCESS TO PROPERTIES.
• LOWER RIDERSHIP THAN LRT.
• INCREASED NOISE & AIR POLLUTION.
• LOW DEVELOPMENT IMPACT.
• LESS COMFORTABLE RIDE THAN LRT OR STREETCAR.
• LESS CONVENIENT TRANSFER AT UNION STATION THAN LRT.
WELLINGTON ST
SPADINA AVE
F G GARDINER EXPWY
LAKESHORE BLVD
YORK ST
YONGE ST
QUEENS QUAY

ALTERNATIVE TO LRT.
BUSES IN DEDICATED CENTRE LANES



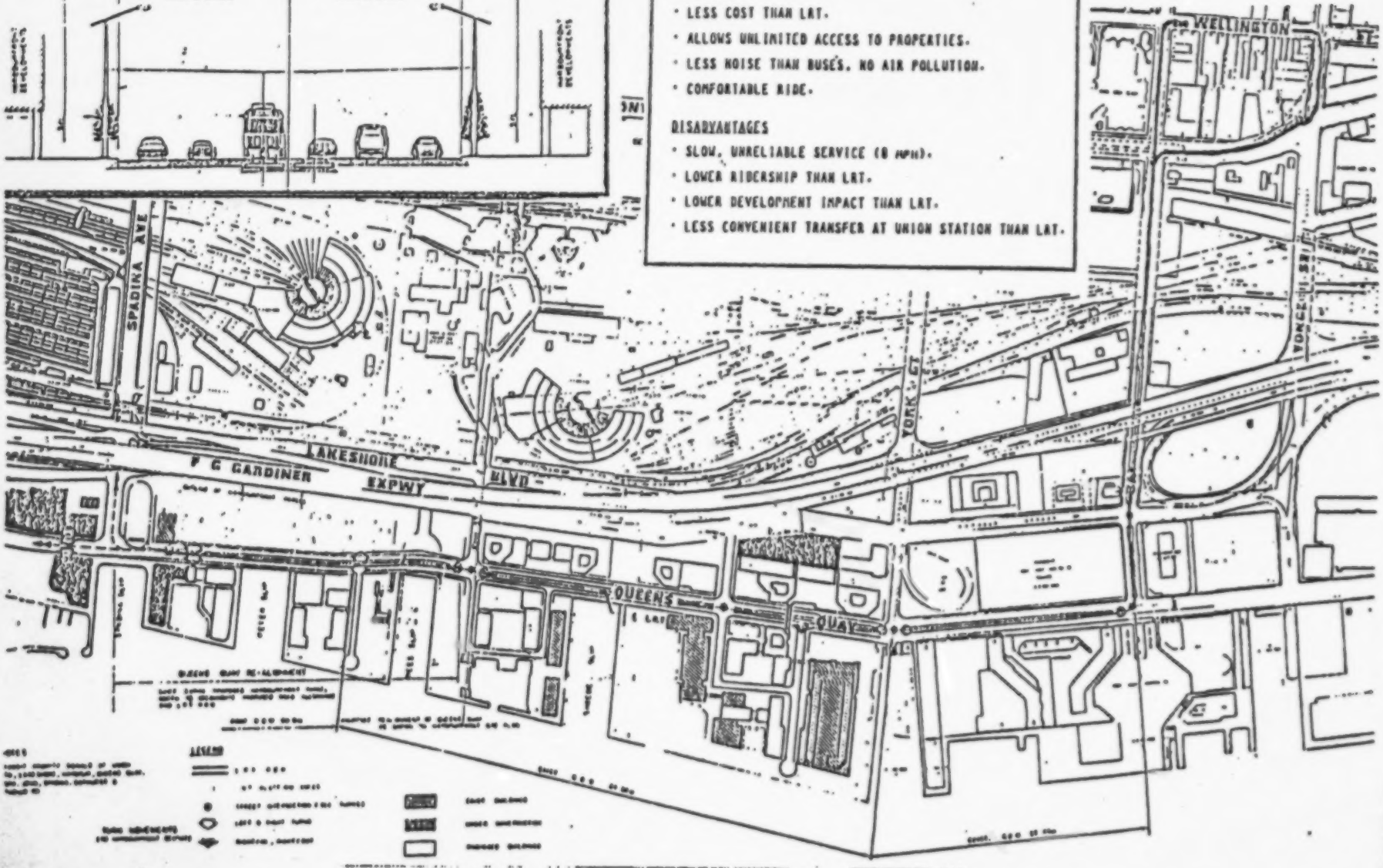
STREETCARS IN MIXED TRAFFIC

ADVANTAGES

- LESS COST THAN LRT.
- ALLOWS UNLIMITED ACCESS TO PROPERTIES.
- LESS NOISE THAN BUSES. NO AIR POLLUTION.
- COMFORTABLE RIDE.

DISADVANTAGES

- SLOW, UNRELIABLE SERVICE (8 MPH).
- LOWER RIDERSHIP THAN LRT.
- LOWER DEVELOPMENT IMPACT THAN LRT.
- LESS CONVENIENT TRANSFER AT UNION STATION THAN LRT.



ALTERNATIVE TO LRT.
STREETCARS IN MIXED TRAFFIC

Capital Costs

	Harbourfront LRT	Alternatives to LRT			
	Current Estimate	Bus Mixed Traffic	Bus Curbside Reserved Lanes	Bus Dedicated Centre Lanes	Streetcar Mixed Traffic
Total 1983 dollars	52.0	11.1	25.3	27.0	37.4
Total 1984 dollars	56.2	12.0	27.3	29.2	40.4
Escalated to completion:					
At 8%	78.0	14.6	33.3	35.5	49.2
At 6%	70.2	14.1	32.1	34.2	47.4

Demand Related to Speed of Alternatives to LRT

	Buses Mixed Traffic	Buses Reserved Curb Lanes	Buses Dedicated Centre Lanes	Streetcars	LRT
Travel Speed	7 mph	8 mph	10 mph	8 mph	12 mph
Reliability	Lowest	Fair	Fair	Poor	Best
Ability to attract riders and support Development	Lowest	Poor	Poor	Fair	Best

Benefits of Harbourfront LRT

TTC Transportation Benefits

- Fast, reliable ride from Union Station to Harbourfront.
- Increased ridership

Community Benefits

- Provides access to waterfront.
- Encourages development south of Gardiner.
- Increased assessment
- Supports Ontario manufacturing
- Eventual links to Spadina, Ontario Place
- Benefits to City of Toronto, Harbourfront, Metro Toronto, Ontario

Since a quality transit line is absolutely necessary to support development of the waterfront, the broader community goals and benefits must be brought to bear in providing the overall justification.

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Streetcars For Toronto
Committee

c/o 831-70 Cambridge Avenue
Toronto, Ontario
M4K 2L5

December 19, 1984

Mr. Walter J. Lotto
Metro Clerk
Metropolitan Toronto
City Hall
Toronto, Ontario

Dear Mr. Lotto,

Attached is a report prepared by the Streetcars For Toronto Committee regarding the proposed Harbourfront LRT. It is our understanding that this matter will be coming before the Economic Development and Planning Committee and/or the Transportation Committee of Metro Council sometime in the early New Year.

We would be most grateful if you could arrange to have our report included as part of the material to be presented at the appropriate meeting(s). Additionally, we would request to be considered as a deputation in order to properly present our viewpoints that comprise our report.

Should there be any questions, please contact me at 654-5639.

Thank you very much.

Yours truly,

Howard J. Levine

Howard J. Levine
Member
Streetcars For Toronto
Committee

STREETCARS FOR TORONTO COMMITTEE

HARBOURFRONT / SPADINA STREETCAR PROPOSAL

DECEMBER 1984 (REVISED)

Summary

The Toronto Transit Commission has proposed the construction of a Harbourfront LRT line at an estimated cost of $56.2-million (1984). This route would operate from Union Station via Bay and Queen's Quay to Spadina almost entirely on a reserved right-of-way.

The Streetcars for Toronto Committee advocates a low-cost alternative for upgrading transit on the Waterfront. We also urge the replacement of the Spadina bus with a streetcar service as approved by the TTC, City and Metro Councils in 1973.

We ask that Toronto City Council endorse the following proposals for transit service to Harbourfront, the Railway Lands and Spadina Avenue.

1. A Harbourfront streetcar service should be implemented as a totally at-grade operation. Reserved lanes should be used where practical to speed service, but complete segregation from traffic over the entire route should not be a prerequisite.

The route should begin at Spadina and Queen's Quay and proceed east via Queen's Quay and north on Bay. Rather than looping in Union Station, the route should continue west on Front to Spadina. Off-street loops should be provided at each end of the line on now-vacant land.

The Harbourfront line should connect with the Yonge-University subway using a transfer station on Front west of Bay. This station would be directly above the existing mezzanine of Union subway station.

Connection of this route to the existing streetcar system should be via Spadina from Front to King.

2. A streetcar service should replace the existing Spadina bus route from Spadina Station (at Bloor) to Front where it would share the proposed loop of the Harbourfront streetcar. Reserved transit lanes should be used for most of the route.

3. No attempt should be made to operate streetcars over the Spadina bridge until a wider structure is available permitting reserved lanes for transit vehicles.

4. No additional vehicles need be acquired by the TTC to operate these routes. Existing PCC streetcars slated for replacement in 1986 should be retained and overhauled to permit their continued reliable use.

Our proposal is a sensible, low-cost way to upgrade transit both on the waterfront and on Spadina. There is an essential difference between our approach and that of the TTC. We see both lines as streetcar routes upgraded with reserved lanes and other traffic control measures, while the TTC treats them as downgraded rapid transit facilities which must be completely segregated from other traffic.

The TTC attitude guarantees that even a simple line such as the one at Harbourfront will cost a great deal of money to implement. This is not a responsible approach to transit planning. All parties -- the City, Metro and the TTC -- should be seeking simpler and cheaper ways to serve Harbourfront.

1. Introduction

The economic expansion which funded large increases in public spending during the 1960s and 1970s no longer exists. Throughout that period, the TTC, Metro and the Province of Ontario planned for enormous growth of rapid transit. No expense was to be spared in building an extensive network of lines using the most recent (and most expensive) technology available. This was never a responsible attitude, but the excesses of transit spending proposals tended to be ignored while capital was available.

The tendency to "think big" has spawned many rapid transit studies. Major rapid transit projects have been announced, but very little has been built. Meanwhile, the technological complexity of proposals has driven up their estimated costs, and rail transit is seen as a luxury which can be justified only in cases of very heavy demand.

Municipalities sense, rightly, that the high cost of rapid transit proposals will limit what will be built. Each vies for construction of its own transit routes because none is sure that a proposed network will ever be completed. Either a route will be too expensive for the projected demand, or other more important routes will take precedence for available funds.

This has already happened with Harbourfront. As the estimated cost of the Harbourfront line grew, suburban council members suggested that there were more deserving projects elsewhere.

The TTC and Metro Council are only now coming to grips with the recently applied cap on Provincial subsidy and the limitations this places on capital project planning. With the high cost of proposed rapid transit facilities, it is likely that at most two major lines will be completed by the year 2000, and then only if the Province does not reduce its subsidy level in real dollar terms. (See "Transit Financing", TTC, September 1984.)

Special levies against developments on adjacent properties have been proposed as an alternate source of capital. This only superficially addresses the problem of high transit costs while the issue of the intrinsic worth of, for example, the TTC's Harbourfront plan goes unquestioned.

Few, if any, improvements to the transit system will be possible without an objective look at what is actually necessary to serve a projected demand. We cannot afford projects such as the Scarborough RT whose cost is almost twice that of the original LRT proposal.

Where high demand leaves no alternative to the expense of a subway, funding should be made available. However, if lower-cost alternatives are ignored, there will not be enough money to build anything.

2. The Harbourfront Line

Council has before it a proposal from the TTC for a $56.2-million (1984) transit service to Harbourfront. In developing this proposal and studying Harbourfront transit concerns in general, the TTC has lost sight of the problem at hand. This has led to an unnecessarily complex and costly design.

Harbourfront services were always studied in isolation because a new, high-technology mode was assumed. Now that the proposal is to expand the streetcar system (albeit with better priority for transit than is found on the existing network), the Harbourfront route must be seen in a different light.

Much of the recent increase in the estimated capital cost of the line stems from the TTC's underground placement of the loop at Union Station. Not only is the loop itself expensive, but its location precludes a simple connection to the streetcar system at Wellington and Bay Streets. Consequently, the TTC proposes to spend $7-million in strengthening the existing Spadina bridge over the Railway Lands in order to connect the Harbourfront route to existing track at King and Spadina.

Several options were originally proposed for a loop at Union Station. All of them infringed to some extent on Toronto Terminals Railway property, and none provided a convenient access to the subway. On-street loops were examined by the TTC, but were rejected as too time consuming. The most recent TTC proposal attempts to remedy these problems at a cost of over $20-million.

Rather than looping either under Bay Street or in the basement of the railway station, the line should continue up Bay to Front and then turn west along Front to Spadina. A transfer station should be built on Front between Bay and York directly above the existing mezzanine of the subway station. Its design would be similar to that used from 1954 to 1966 for the Bloor streetcar interchange with the Yonge subway. This allows a simple, direct transfer between the new streetcar line and the subway, and eliminates additional fare control facilities and manpower required by the TTC plan.

Furthermore, this design avoids extensive disruption on Bay during the construction of an underground loop. As most of the transfer station on Front would occupy lanes which are already closed to traffic, the impact of construction there will be minimal.

Continuing the line west on Front Street serves many purposes. First, it allows streetcars to provide a direct connection between the developing north edge of the Railway Lands (Convention Centre and other properties), and the Waterfront. Second, it provides access to the existing system via track on Spadina Avenue. Finally, it provides the option of serving the south end of the financial district with the Spadina streetcar.

Between University and Simcoe, the road allowance is too narrow for reserved transit lanes together with the various turning channels now in use. This should not be seen as an impediment to the proposal, but as an opportunity to get the most out of the street by using proper traffic engineering measures. An advanced green signal to clear left-turning vehicles is often as good a form of transit priority as a complete ban on turns. The aim is to get the automobiles out of the way of the transit vehicles by one means or another. (An excellent example of this approach can be seen at Bathurst and St. Clair, eastbound, where left-turning automobiles are allowed to enter the otherwise reserved streetcar lane.)

There is vacant land on the north side of Front east of Spadina, and its availability for a transit loop should be ascertained. This loop may not be a long-term requirement depending on the eventual fate of the Spadina bridge (see below), and it may be necessary only to lease the property rather than to buy it leaving open the possibility of future development. If the property cannot be utilised, an on-street loop such as John, Wellington and Peter Streets could be used.

3. The Spadina Streetcar

We first proposed the conversion of the Spadina bus route back to reserved lane streetcar operation in 1973. The TTC, City and Metro Councils approved the idea, and preliminary engineering was done by the TTC for the connection at Spadina Station. However, the project foundered because no loop acceptable to the TTC was found at the south end of the line.

In theory, it would be possible to through-route Spadina cars to Harbourfront, but to make this part of the initial plan would require both lines to be built before either could be in operation. Moreover, such a strategy would preclude tailoring service on one or the other route to meet the very different loading patterns they will serve, especially at off-peak periods. A loop in the Front/Spadina area is required to allow independent construction and operation of the Spadina and Harbourfront routes.

A Spadina streetcar operating on reserved lanes will substantially improve the speed and reliability of service between King and Bloor Streets. Where turns across the streetcar right-of-way are required, they should be aided by advanced-green signals to minimise the delay to transit service.

At Bloor Street, the road allowance is too narrow for reserved streetcar lanes, but congestion in this short stretch is not so severe as to preclude streetcar operation. The existing bus loop can accommodate streetcars, although we feel that the TTC should consider their original proposal for a loop on the now-vacant lot north of the station on Spadina Road. This loop would be less crowded, and would not entail the tight curves (and resulting problems with wheel noise) of the existing loop. Moreover, streetcars would enter and leave the Spadina traffic flow further north of Bloor and their turns would be less likely to conflict with traffic at the intersection.

Since 1973, the character of Spadina Avenue has changed substantially. New commercial activity generates heavy off-peak demand, and this makes the economic case for streetcar operation even stronger than it was 11 years ago.

We stress that this is a proposal which has already been accepted by all parties concerned. The TTC continues to favour it, and there is no reason for further delay.

4. The Spadina Bridge

It is important to remember that the main purpose of the Spadina streetcar will be to serve existing demand on Spadina itself. The number of visitors to Harbourfront arriving on eastbound Spadina buses is quite small. It is simply easier (and usually faster) for most riders to use the Bay or Spadina services from Union Station. The Spadina route should not be thought of as integral to the Harbourfront line in the initial stages of its development.

The TTC has proposed structural work on the Spadina bridge simply to provide access to the Harbourfront line from the existing system. This bridge is old and is the scene of severe congestion. If it is to be used by streetcars, it must be widened so that a reserved lane can be provided to guarantee quick passage from Front and Spadina to Queen's Quay.

Development of the Railway Lands and of Harbourfront, not to mention a stadium, will require replacement and widening of this bridge. The implementation of a Harbourfront or Spadina streetcar should not be deferred until this work is undertaken because its timing is far from certain. Moreover, if the existing bridge is the only connection to the Harbourfront route, its replacement will require suspension of the streetcar service or the construction of an expensive temporary bridge.

Once the bridge is replaced, the possible routings for the Spadina and Harbourfront lines change. The Harbourfront line could operate as two loops (one in each direction), while the Spadina route could operate to the loop at Queen's Quay. Alternately, Spadina cars could traverse the entire Harbourfront loop via Front, Bay and Queen's Quay.

5. Vehicle Requirements

Aside from the infrastructure, the other major component of the TTC's cost estimate for a Harbourfront line is the rolling stock. The current TTC fleet includes 196 CLRVs (the new streetcars) and approximately 90 PCCs (the old streetcars). A further 52 ALRVs (elongated versions of the CLRVs) are on order for the purpose of replacing the PCCs.

The City of Toronto, by a unanimous vote of Council, opposed the TTC's purchase of the ALRVs at the Ontario Municipal Board in March 1984. It is now clear that the purchase was directed by the Provincial government to generate work for their transit agency, the UTDC. Indeed, the TTC's recent "Transit Financing" paper raises serious objections to Queen's Park's interference in transit planning and purchasing decisions generally.

The TTC proposes to equip the Harbourfront line by extending the contract for the ALRVs, and they are pressing for an early commitment to the project to avoid escalation of the vehicles' price. The TTC contends that the remaining PCC fleet should not be retained as its useful life (extended by a major overhaul in 1972-74) is nearly ended. Of course, the deterioration of these cars is partly due to the limited maintenance which they now receive.

The TTC should examine the total reconstruction of its PCC fleet such as is now being undertaken by the Pittsburgh transit system (Port Authority of Allegheny County Transit, or "PAT"). This program is much more extensive than the TTC's 1972 project and involves complete replacement of major subsystems of the vehicles. At a unit cost of about $400,000 US, PAT is planning to rebuild 45 PCCs to supplement its new fleet of ALRVs. With an expected lifespan of at least 15 years, these PCCs are a cost-effective alternative to new equipment.

The intent of the 1972-74 rebuilding was to tide the cars over until they were scrapped in about 1980. They remain in service in 1984, and the roughly $25,000 (1974) per car cost of their overhaul was obviously money well-spent. The TTC has stated that the existing PCC fleet could be overhauled for an additional 15 years' use at a cost of $220,000 (1984) per car. (See TTC Report No. 6, Replacement of PCC Streetcars, May 29, 1984.) This cost does not involve replacement of major vehicle subsystems such as the electrical equipment). It is, therefore, less expensive than Pittsburgh's reconstruction program.

We urge the TTC to seriously consider the option of PCC reconstruction as an alternative to the acquisition of new vehicles for the Harbourfront and Spadina routes.

8. Conclusion

Our Harbourfront and Spadina streetcar proposals offer an opportunity for the City, Metro and the TTC to demonstrate that new transit services need not strain the financial resources of a metropolitan community. There is substantial pressure from various levels of government and industry for the development stimulus of a Harbourfront LRT. This pressure should be directed towards realistic, achievable proposals.

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249 Yonge Boulevard,
Toronto, Ontario, M5M 3J1,
February 14, 1985.

Alderman Maureen Prinsloo,
Chairman, Metro Transportation Committee,
Metro Clerk's Department,
2nd Floor,
City Hall,
Toronto, Ontario, M5H 2N1.

Dear Alderman Prinsloo,

I have read the recent newspaper accounts concerning the proposed Harbourfront transit line and understand that it is a question which your Committee is, or soon will be, facing. While there is no doubt in my mind that the line is needed, I am concerned about the plan to build a grossly expensive turning loop at Union Station. The cost of the loop alone is totally out of proportion to any benefits to be obtained while its existence will forever commit the TTC to its use, thereby eliminating any future flexibility which might become desirable.

Some weeks ago I expressed my concern to the Chairman of the TTC and have received his reply; copies of both are enclosed. All of the points made in the TTC's rebuttal may well be valid to some degree but collectively they still do not overcome the folly of committing the taxpayer to this extraordinary expense before it is known whether it is really essential at all. Because of the nature of the attractions in the area it is to serve, the heaviest use of the new line will not necessarily be in traditional rush hours and, therefore, the extra operating costs imposed by traffic delays will be less significant. I continue to believe that, simply by being visible on the streets, impulse traffic, for example to waterfront restaurants for lunch, will be generated. The decision to build the domed stadium at the CN Tower is a further reason to bring transit closer to the site of the stadium. An alternative to my originally suggested plan could be to turn the route into two "belt" lines operating in both directions continuously via Front, Spadina, Harbourfront and Bay; the problem of a terminus would be eliminated since no turning facilities would be needed at all. Passengers boarding at any point could take a car in either direction since all would reach the same destinations. The problem of a connection with the subway and with Union Station are easily and cheaply solved by stairways from two island platforms on Front Street directly to the subway station concourse which is only a few feet below the road surface. The rail connection to the remainder of the street car system could be via either Bay or Spadina.

I think that what we are encountering is a situation in which the TTC's engineering staff has made up its mind and is reluctant now to consider the alternatives. However, there are many variations possible and what planners should be seeking is a low cost and flexible arrangement, not a high cost and inflexible one.

Yours very truly,

Julian R. Bernard

249 Yonge Boulevard,
Toronto, Ontario, M5M 3J1.
November 22, 1984.

Mr. Julian Porter,
Chairman,
Toronto Transit Commission,
1900 Yonge Street,
Toronto, Ontario, M4S 1Z1.

Dear Mr. Porter,

I have read, with somewhat mixed feelings, of the plan approved by the Commission and Metro Council for the construction of the waterfront transit line. There is no doubt that the service is needed and that it will help to overcome the isolation of the waterfront area from the downtown core. The exclusive right-of-way will also serve to remove passengers from entanglement in the traffic jams which plague the waterfront area so much of the time.

What does concern me, however, is the cost of creating an underground connection at Union Station, an expense which in my view is totally out of proportion to the cost of the remainder of the line and the benefits to be obtained. An above ground loop could be created at relatively little immediate cost; in years to come, the underground loop could still be built if it is found then to be necessary.

Specifically, my suggestion is that rails be laid on Bay Street north (only) from Front to Wellington. From there, cars would turn west on Wellington where track already exists to York and continue west on Wellington to Simcoe, south on Simcoe and east on Front to Bay at which point the cars would turn south to the waterfront. The only major trouble spot would be on Bay between the Gardiner Expressway and Wellington but this could be ameliorated by judicious control of traffic lights plus, perhaps, by a reserved right-of-way through the tunnels which could be shared also by the Bay trolley bus. Wellington and Simcoe Streets are not difficult and both are one-way streets now, while Front is wide enough to accommodate a single track right-of-way with platforms at York, at the main entrance to Union Station and at Bay with the latter having a stair connection to the subway station concourse directly below. Some of the recent beautification on Front immediately west of Bay might have to be sacrificed. Other major benefits

are that this proposal creates the necessary rail link to the remainder of the system via Wellington, thus eliminating the need to build a connection over the Spadina bridge and also serves, without the need for a transfer, some of the major office towers and Roy Thomson Hall. It could be expected also to generate some impulse travel to the waterfront simply by being visible on the downtown streets.

While I wholly support any developments which will serve to make public transit an attractive alternative, I do feel that $70 million is an extraordinary price to pay in this instance and that a saving, which I would estimate could be up to 40% of the total cost, is worth consideration.

I would appreciate your comments.

Yours very truly,

J. R. Bernard

TORONTO TRANSIT COMMISSION

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December 21, 1984

Mr. J.R. Bernard
249 Yonge Boulevard
TORONTO, Ontario
M5M 3J1

Dear Mr. Bernard:

Further to my letter of November 29, your concerns and suggestions regarding the Harbourfront LRT line have been reviewed.

Your proposed at-grade loop, as shown on the attached drawing (No. 0156-G-749) would add 1.44 kilometres to the total route length of 1.68 kilometres, and this addition would be in slower, mixed traffic conditions on congested downtown streets. It is estimated that the net result would be an increase in travel time by approximately 65% (from 10.44 minutes to 17.19 minutes). This increase in travel time would lead to commensurate increases in vehicle requirements and operating costs which are two substantial components of total cost. Furthermore, part of the 1.44 kilometre loop would require new single track to be built.

The only existing trackage is located on Wellington Street from Bay Street to York Street, the north track of which is currently used as part of the turn-back loop for the King Street East rush hour service. The south track could be used but may require upgrading. The introduction of additional street car service in this part of downtown would, no doubt, add to the frustrations of other road users.

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Since a loop is required only for the purposes of turning the Harbourfront LRT vehicles, the below-grade loop into Union Station proposed by TTC staff provides both an efficient turn-around facility and a direct, weather-protected passenger connection to the major terminus of the line. In terms of transit demand, there appears to be little justification for extending the Harbourfront LRT north of Front Street into an area of the downtown which is already well-served by transit or within convenient walking distance of Union Station.

An at-grade loop would result in an inconvenient passenger connection between the northbound LRT service and Union Station. It is difficult to provide a direct connection from Bay Street to Union Station and passengers alighting from the northbound LRT would have to cross Bay Street to access Union Station. The high transfer volumes projected at this point would likely require an underground pedestrian connection across Bay Street to safely accommodate transferring passengers.

To maintain the traffic capacity of Bay Street, the introduction of an at-grade LRT service under the Toronto Terminal Railway viaducts, as required by your proposal, would necessitate that pedestrians be accommodated in the teamways behind the outside columns of the bridge so that all the available pavement outside the LRT dedicated right-of-way could be used for vehicular traffic. This would involve additional expense, and pedestrians on the east side of Bay would be inconvenienced by the need to detour around the existing CP Express building which blocks access to the north from the east side teamway. The alternative would be to partially or totally demolish the building. As well, the relocated sidewalks would negatively impact the existing TTR car parking operations.

By extending the LRT route north of Front Street in mixed traffic conditions, the reliability of the entire Harbourfront service would be placed at risk. Exposing transit vehicles to the delays

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of on-street traffic congestion in the downtown area would undermine the expense and effort of building and acquiring an exclusive right-of-way for the Harbourfront section of the route. Any delays north of Front Street would seriously impact on the entire line since the overall quality of transit service is determined by the "weakest" link in the route.

Reduced construction costs associated with providing an on-street and at-grade loop versus the below-grade loop would be off-set by expenditures required for additional rolling stock, additional trackage, structural changes to existing TTR facilities, upgrading electrical substation facilities and possibly acquisition of additional property (C.P. Express Building). Preliminary assessment of these factors indicates that the cost saving would be in the order of 10 to 15 percent, not 40 percent as you had estimated. The substantial increased operating costs in the future would also off-set the total cost savings further.

While the cost of the project ($70.2 million, escalated-to-completion-dollars; $56.2 million, 1984 dollars) is significant, it should not be attributed to the Harbourfront portion of the line alone. The facilities, including the Union Station loop, will also be used for the Spadina LRT service when the Harbourfront line is extended north on Spadina Avenue to the Bloor-Danforth subway.

I trust the foregoing explains our position with respect to your interests concerning the Harbourfront LRT line and thank you for taking the time to write.

Yours very truly,

JULIAN PORTER
Chairman

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Enclosure